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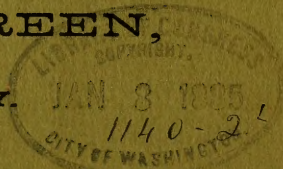
REMAHA.

HOW TO PROPAGATE^{AND} GROW FRUIT.

BY CHAS. A. GREEN,

Editor of Green's Fruit Grower.

ROCHESTER, N. Y.



Two Colored Plates. Over Fifty Illustrations.

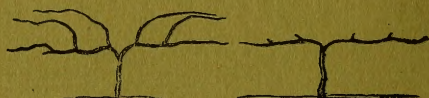
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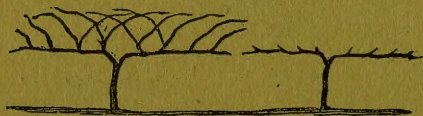
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A. Grape Vine set.
B. First Summer.
C. Winter pruned.
D. Second Summer.
E. Winter pruned.
F. Laid on wire third Spring.



G. Growth the third summer; 18 clusters; $\frac{2}{3}$ full crop.
H. Winter pruned, third winter.



I. Growth the fourth summer; 36 clusters; $\frac{2}{3}$ full crop.
J. Winter pruned, fourth winter.



K. Growth the fifth summer, in full bearing; 48 clusters, full crop, perfect fruit.

Ms. B. 30. 11.

Originated and for sale by
WM PARRY,
 PARRY, N. J.

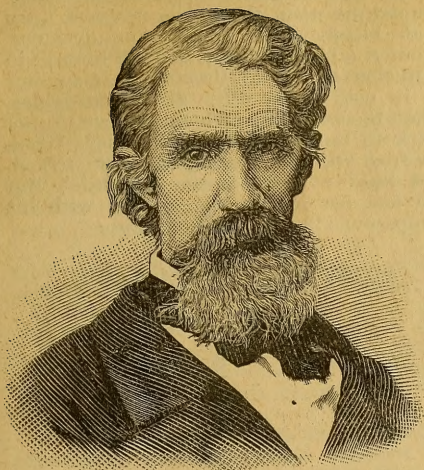


Grantor, N. J.

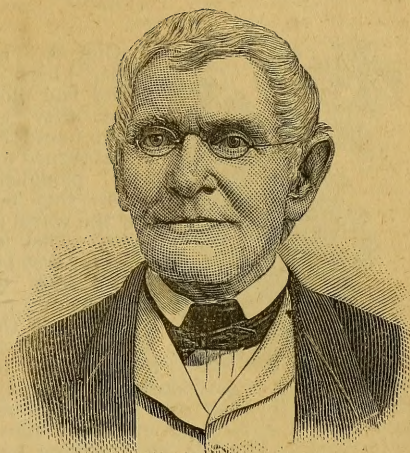
*** PARRY'S STRAWBERRY ***

A SEEDLING OF JERSEY QUEEN, PRODUCED IN 1880. THE JERSEY QUEEN WAS CONSIDERED BY ITS ORIGINATOR, ITS INTRODUCER, AND MANY OTHERS. THE MOST VALUABLE OF ALL STRAWBERRIES. THE PARRY POSSESSES ALL THE MERITS OF THE MOTHER PARENT, WITH A PERFECT BLOSSOM, THUS INSURING A CROP OF FRUIT UNDER ALL CIRCUMSTANCES; UNITING IN A MORE EMINENT DEGREE THAN ANY OTHER, LARGE SIZE, BEAUTY, QUALITY, FIRMNESS, VIGOR OF PLANT, AND PRODUCTIVENESS.

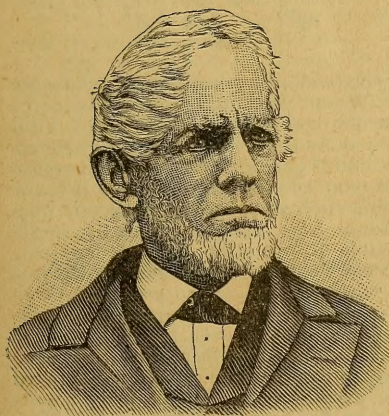
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JOHN A. WARDER.



JOHN J. THOMAS.



CHARLES DOWNING.



HON. MARSHAL P. WILDER.

FATHERS OF AMERICAN POMOLOGY.

No one can enjoy our Fine Fruits, or write about them, without becoming indebted to Patrick Barry, Charles Downing, John J. Thomas, Hon. Marshal P. Wilder, John A. Warder, and other Fathers of American Pomology.

Story of the Weeds.



One day some seeds, that my father had plowed under fifty years before, found themselves turned up by the ploughshare where they could feel the warm sunshine. They were so happy they burst their sides with laughter, and sprouted up thick and fast. Finding them in the field

which had been previously engaged by the raspberries, for their own special and undivided use, I started the cultivator rooting them up right and left, and burying many more. "What a shame," cried the weeds, "to fight us thus in our infancy, before we have harmed you. You should wait until we are big enough to defend ourselves. Take somebody of your own size, can't you?"

Later in the season I found the weeds crowing lustily under the shade of the berries. Again I set the cultivator at work. "Ha, ha, ha!" screamed the weeds, "you can't hurt us now. Our big roots have grasped the soil firmly. If you dislodge us we will take fresh root and begin again, and if you kill a few our seeds will spring up and take revenge. Scrape away, old fellow, we rather enjoy it."

As the fall frosts began to gather, and the weeds had folded their doors for a snug winter, I again found them camped about in social communities. Now my turn had come. "Get out," says I, "or I will put you out. I have endured your intrusions long enough. You have robbed my plants of their food and water, you have made nesting places for mice, you have caught in my clothes and filled the tails of my horses. You have reigned supreme in this farm for a generation. Now your kingdom has fallen. I will have no more of you. Scatter, expire, vanish." But they only chuckled in their tents, for they had often heard such talk before, and the previous proprietor did not think it worth while to molest them at this late season, thinking they had done their worst. "Ho, you, Tom, Jack and Jerry, bring out the great winged shovel-ploughs. Hitch to each the strongest horse; run through those rows until every weed is uprooted." Forthwith I heard the steel shares grinding in the soil. The battle had begun. Then came the

groans and shrieks of the dead and dying. Thousands upon thousands perished upon that bloody field. "Give us quarter," shouted a big weed that had hid himself in vain close by a plant, "would you slaughter us in cold blood after all our struggles, when the winter is at hand and we cannot work to replace your mutilations? When the frost will bite us, exposed and naked, and leave us dead as the stubble?" But the end had come, and he fell with his companions in one common tomb.

HOW TO PROPAGATE.

General Rules.



Everybody should learn how to propagate fruits. When you buy a rare plant for your garden you may increase it to a hundred in a short time by giving it a little attention, and if you do not desire the increase yourself you can do your friends a favor by placing such gems in their garden. The professional fruit grower especially needs all possible information on this subject. His success depends on his having the improved varieties, and as he can get a large supply at an early date by rapidly multiplying them, he should ever be on the alert. When a new variety is introduced, we have often heard people say, "When the price gets low, I will buy." But the price usually keeps up for two or three years. Now supposing it is a new red raspberry, and you buy one plant for one dollar when first offered. You plant in the richest soil possible, manure and nurse it, and the next season you have fifty—you might possibly get a hundred—but say fifty plants. These you plant in the same way, and the second year you have two thousand five hundred, worth probably, at the price usual two years after it is introduced, \$50 to \$100—a

NOTE.—The author desires to give credit to the *Rural New Yorker* for three cuts of grafting the grape, furnished at our expense. To the *New York Tribune* for the "Boy on the Farm," "How Farmers May Begin," and about budding, said articles having been written by the author for the *Tribune*. To Mr. J. Jenkins, Winonah, Ohio, for cuts of budding and grafting, etc., furnished at our expense, from his valuable work, "The Art of Propagation." To Saunders' "Insects Injurious to Fruits," for cut on page 26. In the *Portfolio* are given some "waifs of the press."

good investment, certainly. But farther than this, it is a great pleasure to have these new things of great promise, to watch over and care for them, even though you get disappointed at times, as you assuredly will.

1. Remember that you should plant on rich soil for propagation. A cutting has no roots to send out to a distance for food, and must have it near at hand. More than this, rich soil is more moist than poor, and more porous.

2. Make the soil deep and fine. Hard clay soil that bakes will not answer, unless sand or muck is mixed with it liberally.

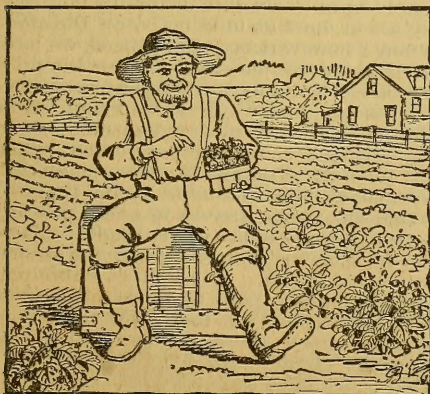
3. Plant and cultivate with care, and give frequent attention. You seldom find a successful propagator with a propagating bed in the further corner of his grounds. Why? He wants it near by, where he will be reminded of its needs.

4. When about to propagate, investigate thoroughly and learn what varieties are most worthy. Do not waste your time on worthless varieties. Get a specimen bearing fruit on your place as early as possible, and judge by its conduct there whether it will be profitable for you to largely multiply it.

5. The profits of propagation are great. From an acre you might realize \$1,000 or more. In propagating some species the labor also is great. Consider that at the start, and do not expect large profits from small outlay of time and attention.

6. Plant and care for your propagating beds in the best possible manner. It does not pay to neglect anything, but least of all a propagating bed. What I have learned about propagation has been from experience. I have met with many failures before learning the best methods. I know that all the books I shall sell will never cover the losses I have sustained to make me competent to give the advice I do in this little work.

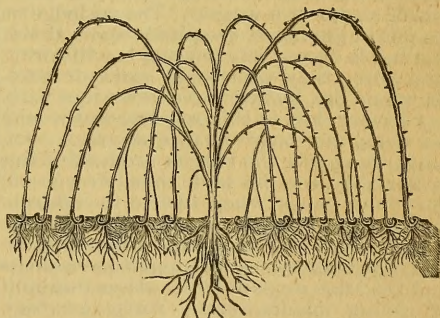
Propagating the Strawberry.



It is possible to grow 500 to 1000 plants

from one vigorous strawberry plant in one season. When you have a valuable but scarce variety that you wish to increase rapidly plant in a bed deeply trenched, and enriched the year previously with all the manure that can be well mixed thereon. Set the plants from four to six feet apart each way. Work the soil about them frequently, but not deep. When the first runners appear remove them. As the plant gains strength permit runners to remain, and draw them out in different directions from the parent plant, laying a small stone over each where the leaves appear. Continue this course, watering in time of drouth with diluted liquid manure. Soil so rich as this is not desirable for producing fruit, but is just the thing for increasing plants. Newly manured soil is not in condition for forcing plants. It must first become rotted and incorporated with the soil. Then it becomes plant food and not before. Fresh manure often prevents plants from growing when placed where the roots come in contact with it. Such manure should be used as a mulch, when it accomplishes a double purpose—keeping the soil cool and moist, and furnishing plant food by leaching after rains.

Propagating Black Raspberries.



Raspberry plant with tips layered.

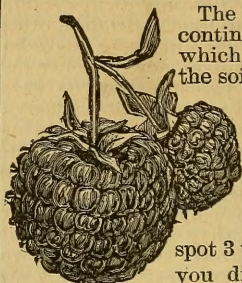
Next to strawberries these are the easiest of all to propagate, yet many do not know how to proceed. I have known people to layer the canes at intervals as they would the grape, leaving the tip uncovered. These people could learn from the wild plants in the woods, which bend over and drop the tip in the loose soil, where it takes root and produces a new plant. Plants would take root often unaided in the planted field were it not for the wind, which sways them about and destroys the vitality of the tips. We have known whole plantations to be lost for propagation by a heavy wind previous to layering. If such a wind comes very early (which seldom occurs) the tips will send out new buds and take

root. But if the season is well advanced into late September, it is useless to spend time with them.

The old rule is not to layer tips until they turn red, are swollen and look snakish. Such a condition is indeed desirable, but the propagator who would wait for such maturity would succeed in obtaining only half as many plants as he who began as soon as the canes were long enough to bend over and reach the earth. Why? From the fact that if layered early (before the cane has grown long), the cane, instead of continuing to extend itself, often from ten to fourteen feet, which is a waste of vitality, will send out new branches, which can, in turn, be layered later. I begin to layer very soon after the berry harvest is over, often at once. First put the soil in fine condition by repeated cultivation (for the pickers have made foot-paths all about), then, with a garden trowel, make a hole two to three inches deep, hold in the tip as nearly perpendicular as you can (if laid flat it will invariably push out and not take root), fill up the hole, pressing it firmly, if very dry. Tips put in with light covering make the best plants, but the wind is apt to twist them out. A good man or boy will put in from 1000 to 4000 in a day in this manner, depending on the looseness of the soil and number of tips per bush. I often have thirty men and boys at this work, going over the fields three or four times, at intervals of about two weeks. The earlier tips are put in the larger the plants are. If the weather is excessively hot and the tips very immature, they sometimes scald or turn black and die, but we have never met with any serious loss in this respect, and would not delay an hour on this account. Of course the lower the bushes are headed the earlier they can be laid, thus we cut off the young canes when twelve to eighteen inches high, which occurs often before blossoming. By trimming closely, after digging plants, the canes support themselves and bear fine crops of fruit. Does this crop of young plants, often forty or fifty exhaust the vitality of the parent plant? Yes, it has such a tendency. Propagating plants should have better care and more fertilizing than those that bear fruit only. By nipping the tip of canes early and often, and making the soil very rich, it is possible to get 100 plants from one the first season planted. The richer the soil the larger the plants and the greater number. The young plants are usually left where they grow until the winter is over. If to be planted on your own place it is better to plant them in the spring, after they have sent up a green shoot two inches high. Raspberry and strawberry roots are quickly destroyed, if exposed to a hot sun or drying wind; ten minutes' exposure will often sap their vitality. If you propagate blackcap tips on low, wet soil, they will be heaved out by frost, unless covered with straw

litter. Hasty people plow furrows for tips, and use plow or shovel to cover them. It does not pay to follow this method.

Propagating Red Raspberries.



The roots of this class continually form buds, which, pushing up through the soil, form sucker plants—some varieties form few, some many. If you plant a choice variety in the spring, in good soil, its roots will probably cover a spot 3 to 4 feet across. If

you dig the parent plant the next spring, be careful to cut the roots close to the cane so as to leave as many roots in the soil as possible, and undisturbed. The strength of the roots remaining in the soil, instead of nourishing the parent will bud rapidly and furnish an amazing supply of strong plants—40 to 100 in many instances. If the soil is mulched with rotten manure it will make it easier for the young plants to push upwards as well as give them food. You can cut off the lateral roots of the parent plant and permit it to remain if you wish, but it will do better elsewhere, and will have another bed of roots formed by another spring. I prefer not to disturb the plant until spring, as root growth often continues during winter, and the young germs are safer attached to the parent plant until spring.

If you are a skilful propagator, and have a green-house, you will take up all the roots you can with the plant, cut them in one-half inch pieces and start them with bottom heat, in boxes of sand. As soon as buds appear on the roots they are placed in shallow boxes filled with about three inches of good soil, mixed with leaf mould. When the plants have grown a few inches above the soil they may be potted or transplanted at once in out-door beds or fields. Similar treatment may be given in hot-beds and cold frames, but such methods require close attention and considerable experience, and the novice will often do better not to attempt them. Gardeners succeed by simply cutting the roots into two-inch pieces and planting shallow in rows in garden beds, covering with sand or mulch that will enable the young germs to push through easily. These require careful weeding and hoeing, but if they get a good start make fine plants by fall. If you have a valuable variety on your place and wish to extend your plantation you can do so by transplanting green plants, suckers that spring up where plants were set the spring previous. We have succeeded best by permitting these green plants to get of considerable size, say six to ten inches, before trans-

planting; then, nipping the tender tops and many of the leaves. Then the wood has hardened, the roots have multiplied, and the plant has a better chance to live than if dug when young and tender, with feeble roots. If I could have learned this by other experience than my own, I should have saved \$1,000 at least. In fact, much information that I give in these pages has cost me large sums of money. I once had a few plants of a valuable new red raspberry that I desired to propagate as fast as possible. I dug up part of the roots and placed them under glass, thinking if they grew well to do likewise with the remainder, but if they seemed liable to fail I would permit the balance to propagate themselves where they grew. Well the plants under glass grew amazingly. I was delighted and of course dug up all and placed with them over artificial heat. But after a time all began to grow smaller, then some withered, and all looked feeble. Every method was attempted to revive them, without avail, and the whole enterprise I regarded a failure. If I had left the roots in the soil where they grew, as first recommended here, I would have secured more and better plants. The few pot house plants that lived did not take kindly to transplanting in the open field, to fight the wind and sunshine. Then I have planted hot house plants when too small, earlier in the season, according to rules, desiring to avail myself of fine rains. But the season proved late and wet, frosts fell upon the tender shoots, worms gnawed into them, some rotted, some were eaten by grubs, more became discouraged by the cold weather that kept nipping their noses, thus when the warm-growing weather came, previous to which they should not have been planted, most of my pets had departed to that bourne from which no traveler returns.

In planting red raspberries for propagation remember that if set in rows seven feet apart the roots will meet in two years, and by the third cover the entire surface. Thus in planting the Marlboro I set them in rows seven feet apart, planting potatoes between the first year. The second year I will have barely room to run a cultivator between the rows. What would I have done if planted three feet apart? When planting for fruit I plant four feet apart each way and cultivate with horse both ways. Remember that some kinds of red and yellow raspberries propagate only from tips. The drooping tendency of the canes indicate this peculiar propensity.

Propagation of Blackberries.

The blackberry is propagated much like the red raspberry, therefore I need not go into details. It takes the blackberry longer to become established than raspberries, but



having once gained a foothold it endures for a long time in the same patch with profit. One season's growth of root is not sufficient for the best success in propagating, as it is with the raspberry. Two years' growth should be given before the parent plant is dug up for propagation. But the spring after one season's growth you can sever the roots one foot distant from the plant by thrusting down a sharp spade and withdrawing it with the least disturbance of the soil possible. Then there will be roots enough left undisturbed on the plant to push forward a good growth of new roots, and the severed roots will sprout up and make fine plants. But the second year you can remove the parent plant and the roots from eighteen inches about it and then there will be enough roots left in the soil to make a good stand of plants. Cut the roots into pieces two inches or more long, depending on the size. Do not cut too short. Nothing is gained, for if left long, two plants will probably be formed, and if too short, perhaps none. The smaller the root the longer it should be cut. We generally cut the roots in the fall, storing in boxes of sand in the cellar, but they may be cut in the spring with nearly equal success. Scatter the roots in shallow trenches six inches wide as early in the spring as the soil will work and cover with two inches of loose soil. If a sprinkling of rotten manure is strewn over the rows after this it will avail much. Keep them well wed or failure is certain. Usually strong plants are made by fall, and in digging these you can leave detached roots in the soil to spring up and renew the row. The parent plant, after removing most of the roots, may be planted in a new bed. In green-houses very small pieces of roots make good plants, the same as with red raspberries. The more you spade among a patch of blackberries the more suckers will spring up. Therefore, if you have a field designed for fruit do not dig plants therein. There are kinds of trailing blackberries that do not propagate from the root, but from tips like black raspberries.

Propagating Currants.

Few cuttings take root so rapidly as the currant. I cut the wood of the present season's growth as soon as the leaves begin to fall, often stripping the leaves by hand. I then cut the wood into cuttings seven to eight inches long, tie in bundles of fifty, lay them in a trench with the *butt end up* and cover with two inches of fine soil over



the butts. This being done the last of August when the earth is warm, the cuttings will callus over and send out roots in from ten to twenty days. I often find the cuttings so well rooted it requires some pulling to get them apart at planting. I plant when I get time in the fall, often in November, in rows three feet apart. I thrust down a spade to its full depth, sway is backwards and forwards, making quite a hole, then withdraw it and a boy slips in two cuttings, one at each side of the hole. We progress in this way until the end of the row is reached. I then turn back and both tread the earth as compactly as possible on each side of the cuttings, sinking our heels down hard. This treading is very important work in planting all cuttings, as it is no easy matter to compact the earth to the depth of a foot from the surface. When the field is planted thus we run a shovel plow between the rows, being careful to throw the soil as near the cuttings as possible and not cover them, the tip end of each being now exposed. This leaves a ridge on each side of the row of cuttings, with a

hollow in the line of the cuttings. This hollow we fill at once with fresh strawy horse manure, thick enough to hide the cuttings completely. If the furrow is not deep I go through the second time with shovel plow after manuring. The ditch made by the shovel plow lets the water pass off, and the manure covering prevents heaving by frost, and stimulates growth so as to secure the best possible plant one year from planting. If currant bushes are earthed up a foot or more in June, roots will be formed about the base of the branches. New varieties are often propagated in this way. The rooted layers are removed, permitting the parent plant to remain.

Propagating Gooseberries.

Gooseberry cuttings do not easily make roots, therefore the bushes are usually layered in July. The young wood of the present season's growth, when immature, takes root readily, therefore as soon as growth enough has been made the layering should begin. They are usually banked up as high as possible in order to cover the new growth in part. In order to accomplish this most effectually I sometimes bend the branches down flat to the earth and cover all but the tips. By fall the whole plant will be a mass of roots, which should then be divided—every piece that has a root, no matter how small the root, planted as recommended for currants and covered with manure and shovel plowed. I have seen old bushes layered, not expecting the old wood to take root there, but to so soften the wood that it might more easily take root the next season when planted like cuttings.

Propagating the Grape.

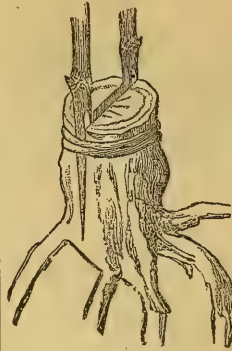
It must be remembered that there are varieties of fruits that are much more difficult to propagate than others. This is the case with raspberries, gooseberries, etc., and especially with the grape, on some varieties of which it is almost impossible to secure good roots. But the larger number root freely from layers or cuttings. Layering is the most simple method, by which any one may succeed. This is done most readily with the young green wood by burying it in June in the soil three inches deep at intervals, often thus securing many plants from each vine. Last season's canes



SPROUTS GROWING UP FROM LAYERED CANE.

can also be layered early in the Spring. Stretch the cane in a shallow trench and fasten it there with wooden pins. Do not cover it with earth until the buds open and the young shoots get several inches high, then gradually cover until four inches deep, placing a stake where each green shoot springs forth, each of which will make a well-rooted vine. Layering is a heavy draft on the vine, thus we seldom layer the first season, knowing it would weaken the vine. It should be layered sparingly until well established, unless some sturdy kind like Concord or Champion. Layers that are poorly rooted are planted in nursery rows one season. Nurserymen always cut off a large part of the roots of vines at transplanting. This gives more fibrous roots, the vines plant easier and grow equally well. There are numerous methods for preparing grapes from cuttings, the most frequent being from two or three-eyed

the vineyard. Cleft grafting is usually adopted for such vines. The cane is first



Cleft graft of grape.

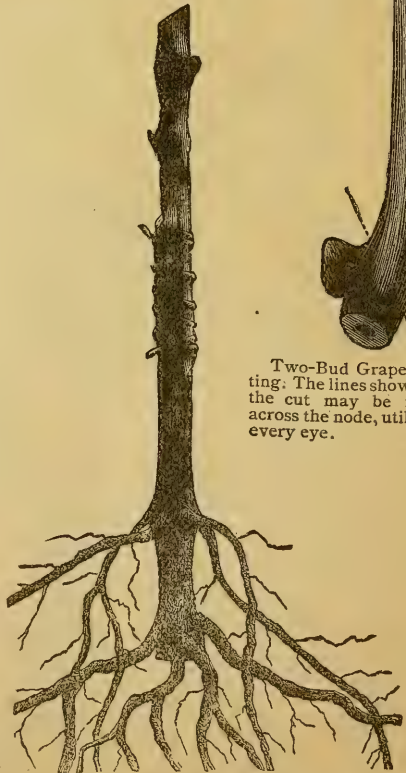


Cane laid down.

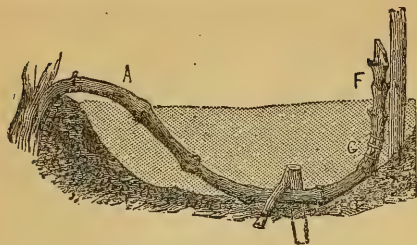
cuttings, each about eight inches long, planted simply by thrusting in the spade (no shoveling out trenches), in carefully prepared beds, in rows twenty inches apart, three inches apart in the rows, all firmly trod with the feet, then mulched with leaves, rotten tan bark, saw dust, cut straw, etc. There are soils so well adapted it is possible to succeed without a mulch, but such soils are rare—in all cases the mulch gives the larger percentage of good rooted vines. As I look back upon my experience I find my best luck to be always with the mulched. A few propagate entirely from one-eye cuttings out doors. The wood is cut an inch above the eye and left as long as possible and yet have only one eye—simply a short peg with an eye near the top. These are simply thrust in a narrow bed closely, in rows a foot apart, and at once covered with three inches of *seasoned* tan bark—when first removed from the tannery it is not so safe. Few weeds came up through this heavy mulch, but the grapes push up readily. Many varieties grow well by this method, while others are scattering, only here and there a plant, but with new varieties there is a great gain in getting double the number of cuttings. Under glass nurserymen propagate from single eyes cut from two to three inches long, started in shallow boxes of sand, and afterwards potted or transplanted in beds. A good way to increase a valuable variety is to graft single eye cuttings on grape roots and plant in the usual way. Grafting is now practiced more largely than ever before, principally on established vines in



Two-Bud Grape Cutting. The lines show how the cut may be made across the node, utilizing every eye.



Whip graft on section of grape root.

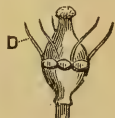
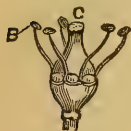


Grafted Cane of Grape

cut off three to four inches below the surface of the soil, then the stump is split with some thin sharp implement, extending the cleft about two inches. The cleft is held open with a narrow wedge in the middle of the cleft. The scion may have one eye or several, but should not be over six inches long. Sharpen it with a keen-edged knife so as to fit the cleft standing open before you, permitting the outer edge to be thicker than the inner, that it may press more closely at the vital part, where the inner bark of both stock and scion meet. Insert it carefully and withdraw the wedge. If the stock is large another graft may be inserted in the other side of the cleft. Bind firmly with stout twine, covering this with a few twists of wire. The string alone would rot, but it prevents the wire from cutting the vine. Then cover the graft with a mixture of four parts of stiff clay with one part of fresh cow dung. For grafting grape roots whip grafting is adopted. Take a yearling Concord vine, or any cheap vine for this purpose. If the roots spring from several eyes one vine will make several roots for grafting. This work can be done during Winter if the vines used for stocks are stored in the cellar. Pack away in sand the same as apple grafts.

If you desire to cross one variety with another to produce seed presumed to inherit the characteristics of each parent, cut the anthers from the stamens with pointed shears before the pollen is shed, when the flowers first open as shown in the cut. As the flower becomes developed, apply the pollen from the flower of the variety you desire to use to the pistil "C." To avoid impregnation by insects or winds carrying pollen, cover the flowers to be impregnated with thin oiled paper or cloth. G. W. Campbell says the grape blossom must be opened artificially before its season of flowering, for the removal of the anthers.

Grape Flower.
C, pistil, B, anthers.



Grape Flower.
D, stamens with anthers removed.

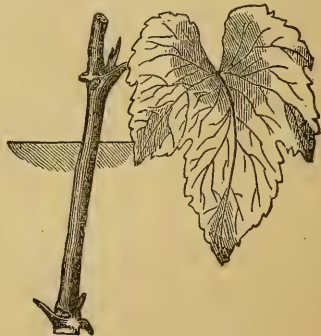
The above cut shows the graft on a strong cane layered in the earth. By this method the parent vine is but little interfered with in case the graft fails to succeed. But the cleft graft is generally used where varieties



Inarching. The dotted lines below show where the new variety is cut off and removed after the union is perfected, and above where the wild vine is severed.

of a vineyard are changed. It is not regarded as difficult, but I advise experimenting in a small way at first.

Green wood cuttings are mostly started under glass. Inarching is performed on green or ripe wood by planting the vines side by side, or by placing one in a pot or



Green Wood Grape Cutting.

box. The two canes are simply bound together after taking a slice of wood from each, and bringing the exposed layers of bark closely together. If connected something like a whip graft it succeeds better. The wounded part should be bound with moss or clay. After the vines have grown together detach the portions not desired.

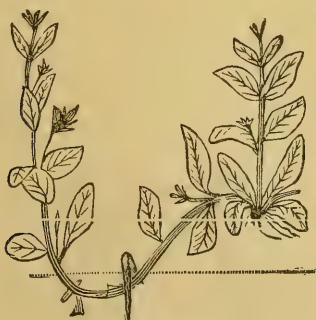
Propagating the Quince.

Usually the quince is cut back after it becomes well established, that it may form numerous young shoots near the base. The



Stool Layering of the Quince.

bush is then earthed up a foot or more in June. By fall the branches will have formed numerous roots and may be removed and planted in nursery rows where they soon make fine trees. By maturing and nursing a crop of layers may be taken every other year from the same stool. Plants may be formed by bending



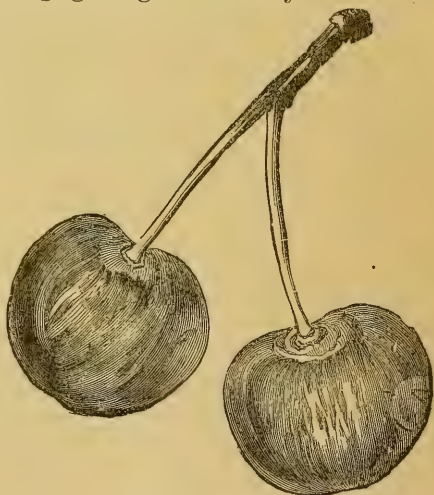
Plant Layer.

down a branch and covering a part with earth. With rare varieties we import from France the Angers Quinces which cost \$15 per 1,000, plant them and bud with the rare variety. This is the most rapid method and makes the finest trees, as the Angers possesses great vigor. We often graft cuttings of the quince on short pieces of apple roots. The apple root sustains the cutting until it forms roots of its own. All these methods preserve the identity of the variety—but if seed is sown no one can tell what kind of quince may be produced. The quince does not root readily from cuttings, yet a few people meet with good success by this method. Make the cuttings long, and prepare them in the fall, planting very early in the spring.

Propagating the Peach, Apricot and Nectarine.

We class these together as all are worked on peach stocks by the same method. Natural peach seed is used by the best nurserymen from trees never budded, coming from Tennessee. These are less liable to yellows than seed grown North. Whatever kind you use prepare in the fall by mixing the seed with sand and exposing them to the frost and storms all winter. This loosens the cement that binds the pits and they open readily in the spring without cracking. Sow these in beds or drills very early, covering but lightly with sandy soil. When the plants become four inches high transplant on a cloudy day to nursery rows three and one-half feet apart, six inches apart in the rows. About the first of September bud them. Next spring cut the tree back just above the bud that you have set, and break or rub off all other buds that appear, except this one that you desire. By fall this single bud will grow from three to six feet high and form a splendid tree.

Propagating the Cherry and Plum.



The seeds of these are treated much like those of the peach. Seedlings are usually bought at \$6 to \$8 per 1,000, as the growing of these, also pear and apple seedlings is a business of itself. The largest seedlings are secured and planted eight inches by three and one-half feet, generally by thrusting in the spade as recommended for planting currant cuttings, but the safer method is to open a trench, but it requires more labor. The highest culture is given. As the plum drops its leaves early it is budded first—in July. The wood of the cherry must not be too sappy, thus budding is deferred until very rapid growth is past, say the first of August here. The after-treatment is the

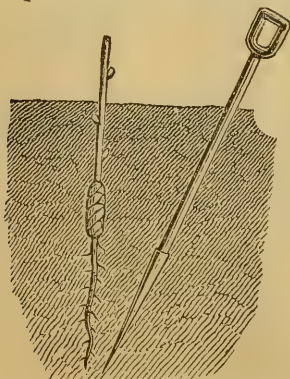
same as for the peach, except that it takes at least two years to get a well-branched cherry tree. Cherry and plum buds give us more trouble than any other. They do not always grow. Sometimes half the cherry trees must be dug up and thrown away after attempting to make buds catch by repeated budding. A small black insect often besieges the leaves of the young cherry and ruins the tree unless destroyed by dipping the branches in tobacco water diluted. A friend picks off the infested leaves and burns them. Cherries and plums are sometimes grafted on pieces of cherry or plum roots, but they seldom succeed by this method.

Propagating the Pear.

Pear seed is expensive and the novice should be contented to purchase pear seedlings one year old, strong, and plant eight inches by three and one-half feet. All nursery ground should be well drained and fertilized, and put in the finest possible condition before planting. Pear roots are the most sensitive of all roots, and require careful planting and every possible attention. The leaves of pear trees are subject to blight, especially on American seedlings. Those imported from France are less subject to leaf blight. To be safe against blight (which renders budding impossible by tightening the bark), the pear is budded early in July, as soon as mature buds can be secured. The pear may be grafted on pear roots, but budding is much safer.

Propagating the Apple.

Any person can grow apple seedlings. Get pomace from the cider-mill the moment it comes from the press. If it heats it is ruined. Open trenches in well prepared soil with a shovel plow three feet apart. Scatter the pomace thickly therein. Then run the shovel plow between each row, thus covering the pomace very lightly. If you spread rotted manure along the



Planting Root Graft; pressing dirt against it with dibble.

rows, or ashes, it will avail much. Do not be afraid of getting in too much seed—you can thin the rows with a garden rake when the plants first come up, if too thick. Some say the pomace sours the soil. Do not believe this. It is even better than cleaned seed on heavy soil, as the straw mixed with it keeps the soil porous, permitting the young plants to come up easily, and you avoid the risk of soaking the dry seed. Dig the seedlings the first succeeding fall, sorting out the larger ones. These may be root grafted, cutting the roots into pieces about three inches long. The smaller ones may be planted and budded. If not large enough the first year they may be budded the next. We only use the best. The after-treatment is the same as before described. Root grafting is done in the winter, the grafted roots being packed in moist sand. The budding may be done any time from August 20th to October.

Propagation by Cutting.

Mr. J. Jenkins says: Most varieties of Grape-vines, Currants, Gooseberries, Roses, and much of the shrubbery supplied by nurserymen, grow readily, and are grown from out-door cuttings. Whether of trees or vines, in-door or out-door propagation, the operation of nature in the growth of the cutting is the same. The bud holds within its brown envelope the principle of life, which extends through the cells that have carried the circulation, extended the growth, and established the bud. After the cutting is divided, nature's first effort is to form a callus with the descending cells that would have gone to extend and enlarge the roots on the mother vine.

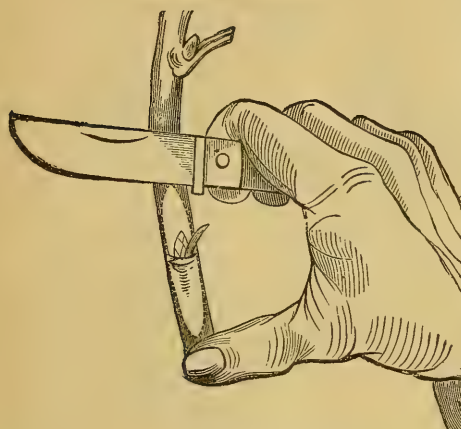
If instead of abruptly dividing the cane or shoot to be used as a cutting, a system of ringing or strangulation be followed, every bud may be made to produce a plant. This strangulation or ringing is performed on soft or green wood by tying thread tightly around the point where the cutting is to be separated, and on hard wood by a ring of copper wire drawn closely. This will cause an enlargement and a deposition of cambium at the point of arrest and make the growth of the cutting thus prepared, when finely separated and planted, almost as certain as though they already had roots.

One very successful experiment with out-door cuttings of the grape was performed by allowing the cane to remain on the mother vines until the buds had started a growth of one-half inch or more, and the leaves had begun to unfold, every eye was separated, the old wood placed entirely below the soil, the new growth just appearing above the ground, shaded carefully, with a result of full eighty per cent. of vine.

In the usual manner of preparing cuttings greater success follows when the cuttings are taken off immediately on the fall of the leaf before freezing, when they

should immediately be packed away in moss or soil until time for planting in spring.

Grape cuttings from out door planting may be made with single eyes, but all the advantages of a two-bud cutting may be retained by simply cutting across the node with a sharp knife, or with shears, commencing the cut opposite and one-eighth of an inch or more below the bud and finishing one-eighth of an inch or more above.



Cutting a Bud

The Art of Budding.

The object of budding is to rapidly multiply with the least possible consumption of coins and time. Every leaf bud may make a tree. A slow growing or stunted stock cannot be budded at all with success, therefore the best possible culture should be given. All trimming of the stock should be deferred until the day of budding, as every leaf taken from a plant or tree lessens the growth. Many labor under the delusion that by removing the shoots from the trunks of their young orchard trees while in leaf they are hastening their growth. Bands for budding are secured by removing the bark of basswood in June or July and soaking it in water until the inner bark peels off in thin ribbons. The pear in this section is budded in July, as the leaf

blight usually attacks it soon after, stopping all growth, rendering budding impossible. After the pear, we bud the plum, then

the cherry, following with the apple, and closing with the peach from the 10th to the last of September. Though much depends upon the season, I have found that early budding generally succeeds the best, but more attention is required to prevent the cutting of the rapidly expanding stock by the band that holds the bud. While a certain maturity of bud is desirable, immaturity is seldom the cause of failure. Apple buds must be set before they have become very prominent, or the season will be passed. I have budded the peach successfully when the buds set the stock.

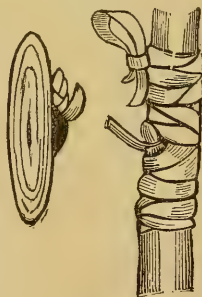
could scarcely be discovered with the naked eye. Pear buds are the only ones I recall as having fully matured before setting. If the season is favored with frequent rains and the stocks are pushing ahead rapidly, budding may be deferred with less danger than if the season is dry and the sap moving slowly. A good budder selects his buds with great care, using none that are feeble or on soft, spongy wood, and no blossom buds. While the tying of the buds is easily learned by a bright boy, it must be thoroughly done or the buds will dry out and fail.

The illustrations tell how to bud better than words. The leaves are first removed,

leaving a short stub only for a handle. The bud is removed, with an inch in length of bark and a little wood directly under the bud. This wood used to be peeled away, but now it is left attached to the bud with better success. An opening is made in the stock, the bud is inserted from the top (by some from the bottom) and gently pressed into place by the part of the leaf stem remaining. There is seldom any failure in budding when done by experienced hands, but with the novice failure is not infrequent from the following possible defects: 1. The cross cut in the bark may not have been sufficiently wide to prevent breaking when opened; or too much effort may have been made to raise the bark with



Vance's Method inserting bud C where a bud has been cut out of the stock.



Bud: Bud inserted and tied. pressed into place by the part of the leaf stem remaining. There is seldom any failure in budding when done by experienced hands, but with the novice failure is not infrequent from the following possible defects: 1. The cross cut in the bark may not have been sufficiently wide to prevent breaking when opened; or too much effort may have been made to raise the bark with

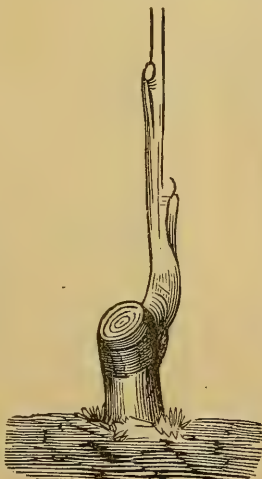
blade or handle, thus causing roughness—the knife-handle should never be used in this manner. The upper corners of the bark of the stock should be raised with one steady pressure of the knife-blade, and the bud then made to force its own way home, where it will fit perfectly, and no exposure of the parts to drying influences occur. The novice often fails to push the bud successfully to its place by the frail stem. The pressure should be toward the stock and downward. In obstinate cases we press down by inserting the knife-point crosswise just below the bud. 2. In taking out the wood attached to the bud the vital parts are liable to be injured. 3. The bud may have been inserted when quite immature, or the shield may have been cut too short—it should measure at least an inch in length. 4. If the bark clings to the stock all efforts to bud will prove futile; but this seldom occurs in the proper season under good cultivation. 5. The tying of the bud may have been loosely or otherwise imperfectly done, or the bands left on too long, causing the bud to be seriously cut by the expanding stock. The bands should in most cases be removed



Ring budding, after fifteen days. 6. The soil should be cultivated at once after budding. I have known men to spend a day budding 500 trees, yet over 4,000 peaches have been budded in one day by an expert. I never heard of 4,000 plums or pears being worked in one day. I would prefer to have 500 well done than to have 4,000 worked poorly. Formerly apples were mostly root grafted, but nurserymen are getting more in the habit of budding them. Some of the buds inserted fail to grow. These are rebudded the next season, with the exception of the peach. Peaches that fail are grubbed out without apology. Cherries often get too large by the second year, but apples and pears might be rebudded the



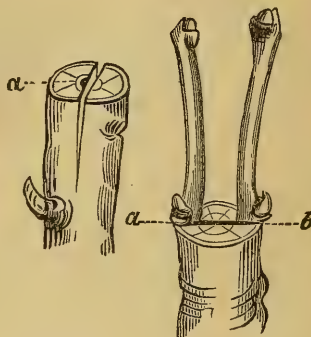
Tying bud growth to stump of old stock.



First season's growth from bud.

third year if necessary, but such large stocks produce crooks where the buds push out. It is more difficult to succeed in budding the plum than most other fruit trees. Experienced nurserymen buy the strongest stocks designed for budding, and would take no poor ones as a gift. They plant in rich soil and crowd them with high culture. Buds succeed in such stocks where they would fail in poor stocks, or these not so well cared for.

How to Graft.



Cleft Graftings. Stocks cut and split, and Scions inserted.

Scions for grafting are usually cut late in the fall and stored in moist sand in the cellar, but hardy varieties may be cut at any time before the leaves begin to grow. Grafting out doors begins in the spring with the first warm days, and continues until the leaves are expanded in May. The scions being kept dormant the best time is when the leaves on the stock are just pushing out. But with the plum and cherry grafting should be done very early. The peach is seldom grafted. With large trees a branch is sawed off, the stock split, a wedge inserted to hold it open while a scion is placed at each side as shown in the cut *a b*, taking pains to make a close fit where the bark should meet. The cleft and wound should then be covered with grafting wax to keep out the air, made of equal parts of resin, bees-wax and tallow, melted together.



Whip Grafting.

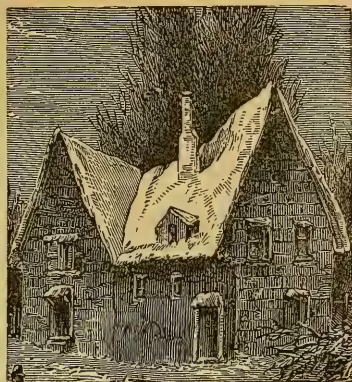
WHIP GRAFTING and saddle grafting are methods of splicing the scion to the stock, offering a larger surface of contact, and being best suited to small stocks and indoor work. Apple root grafts are usually whip grafted,

and wound with a waxed string, no attempt being made to keep out the air, as they are at once packed in moist sand, the string being intended to hold the stock and scion firmly in place. In budding and grafting a thin-bladed knife with a sharp edge should always be employed. If the cutting is done with a blunt dull knife there is but little hope for success. The graft has a remarkable effect on the roots of the stock. In starting apple trees in the nursery, we graft on roots of seedlings, after such roots have been affected by the graft for three or four years, we find that those grafted with Red Astrachan, for instance, are very fibrous, branching out near the surface, with few tap roots, while the rows adjoining, or parts of the same row, grafted with the Duchess of Oldenburgh or the Fameuse, are destitute of fibers, possess only three coarse prongs, as a rule, one of which is liable to be a tap root seeking an abode far down in the subsoil.

Saddle Grafting.

Here's a good label for fruit trees. It is made of tin, six or eight inches long, and a inch or so wide at the wide end, tapering to nearly a point at the other. Write the names of the tree with a scratch-awl, or a saw-file ground to a sharp point, bearing on hard enough to cut through the coating of tin into the iron. The rain will rust the letters and make them permanent. Wrap the narrow end once, loosely, around a small side branch. Then you can always know whether you are eating an apple or a turnip. This is the Farm Journal plan. John J. Thomas' plan is to use zinc strips and mark with a lead pencil. This makes a permanent label.

In planting pistillate strawberries (marked "P" in catalogues) do not forget to plant them within six to ten feet of the Wilson, Sharpless, James Vick or other hermaphrodite varieties, that the pistillate blossoms may be made to produce fruit.



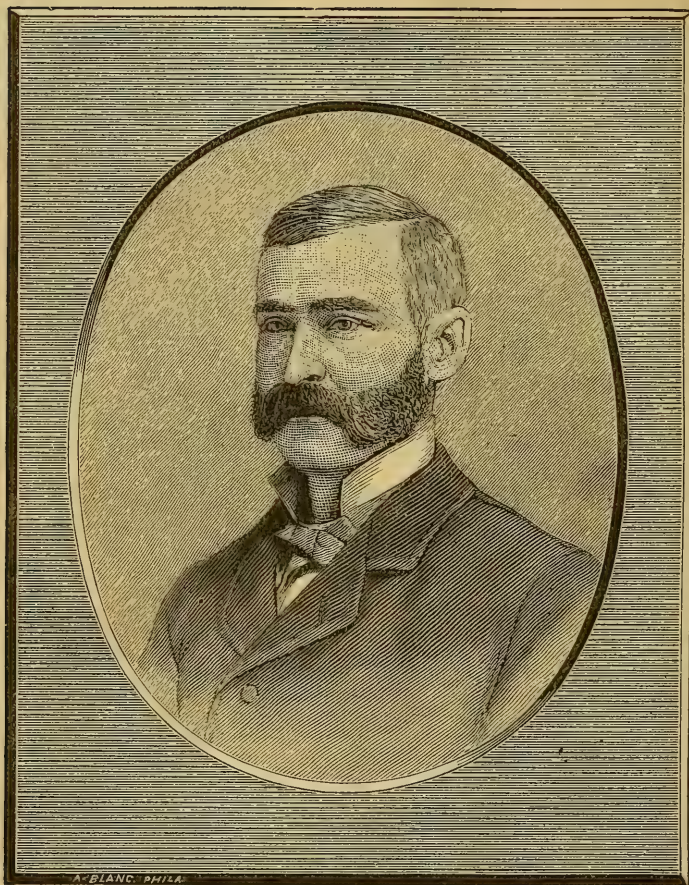
The Boy on the Farm.

THE AUTHOR'S EXPERIENCE.

A group of farmers' boys was gathered before the old stone school-house, with its tortuous benches, cracked corner and distorted architecture, one bright morning a quarter of a century ago. "Do you see the young man riding the bay horse yonder?"



asked one. "He's leaving these parts—going to seek his fortune." We watched the traveler closely as he passed, noted his attractive equipment, his manly form and bearing, and his intense and determined countenance. "Were I in his place I would drive a stage-coach," said one. "I would drive an engine," said another. "I would hunt in the forest and fight Indians," said another. "I would stand before the mast on the sea," said the fourth. Boy-like, I envied his freedom from the restraints of school and home, his freedom to go wherever he wished, his freedom to choose from all the callings in the great mysterious world that opened so invitingly before him. Following him with my eyes until he passed out of sight over the hill toward the distant city, I pictured for him in my imagination a glorious career. Whether he became distinguished or sank into obscurity I know not. I never heard of him more. But the sanguine, determined horseman, in defiance of wise counsels and admonitions of disaster, turning his back upon the world of his childhood, and driving out into the great unknown, is a type of young America. He is driving forth to-day from American farms in every township. It is his dauntless and progressive spirit that has extended our railroads, developed the plains, opened mines, reared cities, and made this a country of which all are so proud. This spirit, inherited, is one source of discontent in the boys on the farm, but there are others more prominent.



THE BOY ON THE FARM. AGAIN.



I have happy recollections of the joyous days of childhood on the farm. These are rich legacies with which I could not be tempted to part. Farm life may be made a paradise for children—not a hot-house existence, stifling the victim with rich odors and indolence, causing him to wilt at the first exposure, but free, industrious, out-door life, bronzed with the hot blasts of Summer, buffeting Wintry winds and storms, like the isolated oak, deep-rooted and knotty armed; a life that teaches humility, self-reliance and courage; the successful training-course for the coming distinguished men. The farmers' boys who were my school-mates did not complain of farm life, but were contented and happy, yet as they approached manhood many dispersed into speculation, law, medicine and the ministry as naturally as ducks take to the water. At the age of eighteen I also began to experience a feeling of unrest. Enjoying unusual opportunities for success on the farm, I reasoned thus in the premises; "Farming is dirty work—if I put on a clean suit I am certain to encounter a dirty job; it is hard work—from sunrise to sunset the days are not long enough; it is often a cruel occupation—the mutilation and slaughter of blameless animals make me shudder; I may associate with those possessing less refinement than myself, and thereby I lose, whereas I might gain by associating with those superior to myself; farming is said to be the most independent occupation—why, then, does it not bring greater honor, dignity and wealth; farming is not free from risk—insects, vermin, disease, and the elements prey alike upon the provident and improvident; that the farmer is not crippled by these severe losses is accounted for in his rigid economy and forced industry at such seasons; the farmer markets so many items he does not keep well informed on their shifting values, and does not attempt to influence the market price, thus he is preyed upon by parasites; lastly, in the professions and many lines of business, the reputation for ability or fair dealing is often worth a fortune; not so with the farmer—his grain is dumped into the same boat with his neighbor's; his brand upon his produce gives it little, if any additional value, and should he retire he has no 'good will' to dispose of." Similar thoughts encourage, but are not the

prime cause of discontent with boys on the farm.

Our homestead farm was one of the best in New York State, located on an eminence commanding views of great beauty, surrounded by friendly and intelligent neighbors, adjacent to attractive villages, churches and schools. My father possessed liberal views of life, and we all indulged in luxuries and sports in common with those out of debt and with money in the bank. My brothers and I were given opportunities



for recreation, education and private enterprise. While yet a lad I leased the homestead for two years, during which time, prices ruling high, I cleared over \$2,000 above all farm or personal expenditures. Notwithstanding such favorable circumstances, often cited as a recipe for making boys "stick," none of my father's children continued farmers. With a fair prospect of ultimately owning the homestead, I left it, served an apprenticeship and for twelve years was a member of a firm of bankers in



a city. There I learned how easily fortunes are made, and how easily lost. Learned the value of good digestion, and of the refreshing sleep of him who labors under the open sky. Learned when clouds threatened, when the waves of the panic shook my bark, and the sea was strewn with wrecks, that the farm was a safe harbor, and I longed to cast anchor again in that quiet retreat, remembering only the pleasant chapters of my farm life. Do I then regret leaving the old homestead? No, for there discontent would have relaxed my energies. No, for I cannot help feeling that I am a stronger man than I could have been had I remained.

The principal cause of discontent in the boys on the farm is this: Many of them were designed by the Almighty for specialties; are endowed with qualifications for mechanics, navigators, inventors, lawyers, doctors, clergymen, etc. What a wonderful provision that all are not born for one pursuit. What confusion and suffering would result were



it otherwise. Knowing well the characteristics of my brothers and schoolmates, who did not "stick to the farm," I am confident they would have made poor farmers, whereas in their proper spheres they were successful. Therefore I dispute the popular theory that we may advance agriculture by inducing those boys to remain farmers whose natural inclinations would lead them into other pursuits. A man struggling for success in a field wholly unsuited to his tastes and natural endowments is pitiable, and often ridiculous.



HOW TO GROW FRUIT.

The Author's Experience and Advice.

HOW I BEGAN.

Deprived of good health by city life I longed to get back to the country and thought it would be a fine thing to fix up a run-down farm and make it valuable. It seemed as though it would be a pleasure to improve it here and there, and make each stroke tell on its beauty and usefulness—like touching up a painting. It was a fine theory to consider behind a counter—not so fine in practice I discovered. I had no trouble in finding a run-down farm—lots of them—but this one had splendid soil, and a perpetual spring, big enough to turn a mill, bubbled up near the house and flowed through it. But it was an awful looking place, everything battered, wrecked and forlorn, with mosquitoes and rats in abundance. I pitched into it with a will, full of enthusiasm, not permitting my family to come near it until the painters and carpenters had been at work a month. I made some bold strokes in tearing away door-yard and other fence, enlarging the grounds from 16 feet square to 18 acres. I trimmed the orchards, cleared away rubbish, laid out drives, seeded lawns, rebuilt walls, put in new foundations—whacked away right and left, and was so lost in the excitement of the enterprise as to virtually make a hermit of myself. How the money flew! Why a thousand dollars spent on such a place would improve it some, to be sure, but straightway another thousand would have to be added to it—there was apparently no end to the outlay demanded. We are not through fixing up yet—perhaps

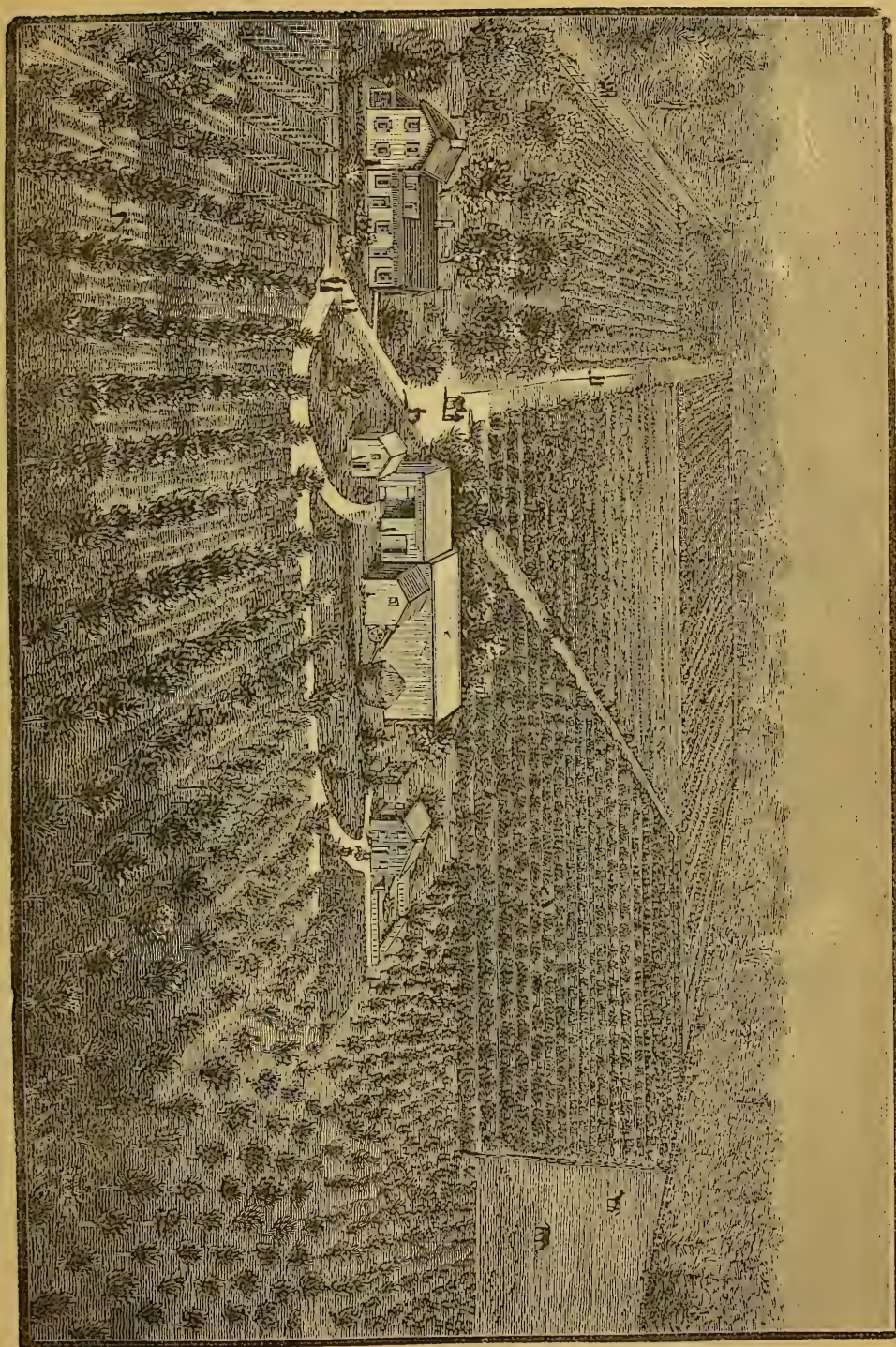
never will be. You can see by the illustration, that the place is not what it was, but it does not satisfy us yet.

We planted the farm to fruit—big fruit, small fruit—all kinds that grow on earth. No one about us understood fruit, and all thought I was crazy. My own father and mother looked upon me a harmless lunatic on the fruit question. I kept at it, however. The good farmers looked shy at the big strawberries and red raspberries which I offered them, for we held them at a big price. The first few crops went off slowly. This gave me the blues, still we planted more and more. Crazy as a March hare, you see. Well, by and by, the fruit sold better, no one knew why. Then the good people came to the farm and engaged them in advance of picking—could not supply them. They would stand before the fruit house waiting for the pickers to come in with their trays of berries. Sometimes we had to send them away without any. They often came ten miles to get berries—farmers, villagers, laborers, grocers, blacksmiths, shoemakers, tinkers, bankers, merchants, ministers—all after berries. Now, who was crazy? Then people wanted plants of those big, sweet berries. Not only our neighbors, people in every state on the continent wanted plants. We have no reason to complain of the returns the old farm has yielded. It has kept us healthy, happy and fat; if we have not a fat pocketbook it is not the fault of the Fruit Farm. Will we sell the farm? No!! Too many associations connected with it. It must go down to our children's children.

Advice to a Beginner.

Late one rainy night came a knocking at our office door. Our guest had traveled a hundred miles to see us. He was young, intelligent, full of enthusiasm. His object was to serve an apprenticeship at fruit growing with us. He had money, having sold his fruit farm in Maryland, where he had been growing peaches. He was now employed as stenographer, had served as amanuensis to a prominent literary man, and was accomplished in various matters. Looking him over carefully after supper I remarked that some people had poetical ideas of fruit culture, which facts would not substantiate. I told him that we had an apprentice with us last year. We paid him wages, probably all he earned. He worked as the other help worked, early and late, at whatever we had in hand, regardless whether it would teach him the art of fruit growing. He dug plants, planted them, hoed, trimmed, picked berries, sold them, and waxed fat and hearty. I often explained matters to him that seemed to be of importance to an apprentice, but this kind of teaching did not appear to make any impression. At the end of eight months he drew his wages and went home. His father was delighted to find him grown so robust.

OUR FRUIT FARM NEAR ROCHESTER, N. Y., IMPROVED.



and strong, but I think the boy did not feel quite satisfied with what he had learned. But when he begins fruit growing for himself, on his own soil, he will find that he has learned more here than he realized. It would be impossible for even the most stupid and disinterested person thus to be in contact with plants and trees for eight months without gathering much information of permanent value.

I related the experience of a man who left the city in embarrassed circumstances and moved on a farm, with no knowledge of fruit growing. This man made it pay as best he could with farm crops for the first few years, planting strawberries, raspberries, blackberries, currants and the large fruits in a very small way, intending to learn by experience. He found there was much to learn, and made some mistakes, but gradually increased his plantations of fruit, gradually giving up the farm crops, until he now depends entirely on his fruits, and is successful beyond his expectation.

HE KNEW IT ALL.

I told him of another man who considered himself well posted in general fruit culture, and who, in fact, had considerable experience one way and another. He began fruit growing as a business by planting *twenty acres*. He was well satisfied with his methods and desired no information on the subject. He made rapid progress in planting and remarked that he could plant two acres to our one. As dry weather came on later, we enquired how his plants were doing. He rather evaded the enquiry. Later, I drove by his place and did not see that amount of verdure that should be apparent on a field of fruits at that season. Passing that way in the fall I saw here and there a plant standing solitary, like some lone sentry after a disastrous battle, all his companion plants having died ignominiously. This man had planted on a freshly-turned timothy sod, in the most hurried manner. The plants were dropped in advance of the planters and permitted to lose their vitality, as they will in a few moments when exposed to the sun and wind. They were then thrust into the soil carelessly, the earth left loose about the roots. Next spring the entire twenty acres were plowed up. All the work and cost of plants was lost.

I told our guest of another young man who desired to grow fruits, but felt that he knew nothing about the business. In order to gather information he visited men who had experience, talked with them about their plantations when they were planting, pruning, picking, etc. He also read everything he could pick up that treated on the subject of fruit culture, discarding such notions as did not appeal to his good common sense. With the fund of information thus gathered he began operations. He

was active, industrious and full of enterprise. His father owning a large grain farm set apart a portion of it to his boy for fruit growing. He made a business of attending to his fruits; he succeeded, and hereafter will make money faster and easier than most people who till the soil.

I imagined my guest's ardor would be dampened by these practical experiences, but not so; his health demanded that he should give up office work, and his inclinations were all toward fruit growing. He asked if I would advise him to spend eight months as an apprentice in small fruit culture. I confessed that I had some doubts as to what advice to give, but said that if I were in his place, with money in my pocket to buy a farm with, and such little experience as he had gathered, I would begin at once for myself, relying on such information as I could gather by visits to practical fruit growers, and by reading. Certain things must be learned by personal experience anyway. But possibly time could be gained by serving an apprenticeship. Under different circumstances I would advise it. As it was I did not feel that my guest would be contented to work so long to learn so little, as it would appear to him. He decided to pitch into a farm of his own at once, and I bade him good speed next morning as he took the early train for home.

LOCATION OF A FRUIT GARDEN.

Old farm gardens are often so completely filled with seeds and roots of persistent weeds as to render them unsuitable for strawberries, which should have clean soil free from sods, clods, roots or other rubbish. I therefore sometimes recommend selecting a new site for the fruit garden, for I find the open fields much freer from weeds than old gardens. But wherever it may be located the fruit garden should contain an acre if possible. Now of all who will find it impossible to spare an acre for this purpose, the farmer who has the largest farm will be foremost—he is the man who has no place to plant fruits. He is like the miser—the more he has the firmer his grip. If you really have not an acre much less will give wonderful results. Select high ground if possible—not hill tops, but that naturally drained. If obliged to select low ground put in tile ditches every two rods. Plow and cultivate the soil frequently the season before planting, so that all roots of weeds and sods are rotted and the soil made fine. We follow the common plow with a subsoil plow, using one horse sometimes, but more often two, on the subsoiler. This subsoiling is not absolutely necessary, but pays a big dividend in the succeeding crops. Fresh manure should not be applied just before planting, but several months previous, so as to become rotted and thoroughly mixed with the soil, or as a mulch as Winter

approaches. Strawberry growers often manure heavily in the Spring, plow under and plant potatoes, then plant strawberries in September or the following Spring.

I will suppose the plat to be nearly square and that it has been fitted as above described, and Spring has come. Do not touch the soil until it crumbles after being pressed in your hand, but be ready to push the work the moment it is dry enough. It will often do to drag down the surface when too moist to plow. Drag down, cultivate, roll, until the surface is made fine, then plow eight to ten inches deep, let it dry a while, then fine the soil again thoroughly. Consider how much after labor can be saved by thorough preparation, and how much is lost, and what little satisfaction is attained with imperfect, hurried preparation. No after culture will make amends. The mistake of imperfect preparation of the soil is plainly seen year after year, and often leads the proprietor to give up the enterprise in disgust, without perhaps knowing the cause of failure. Now mark out the entire garden with an ordinary corn marker, in rows $3\frac{1}{2}$ feet apart both ways, the same as though for planting corn. Omit the first row on the east side, plant grapes in the next, seven feet apart in the row. Omit five rows and plant grapes again, planting in this way from fifty to two hundred vines, according to the size of your family and the number of your fruit-eating friends. Omit five rows (those $3\frac{1}{2}$ feet apart) and plant a row of peaches $10\frac{1}{2}$ feet apart. Omit five rows again and plant quinces; then, in the same manner, plums, pears and apples, each time omitting five of the rows $3\frac{1}{2}$ feet apart, which leaves all the rows planted $17\frac{1}{2}$ feet apart. All the vines or trees being planted at points where the marker crosses the rows, obviating all sighting or measuring. Now plant the vacant rows between the grapes with strawberries, and between the rows of peaches, quinces, etc., with raspberries, currants, blackberries, etc.

THE CITY GARDEN.

If your operations must be confined to a smaller fruit garden or to your vegetable garden, satisfactory results can be secured here also. Plant dwarf trees as far as possible, and place all trees along the borders on all sides. Their roots will feed on your neighbors' land probably, and their branches leaning over his side of the line fence, he will be legally entitled to all that falls on his soil, but he cannot legally take from the tree though growing over his land. You will do him good service by tempting him to plant likewise for his family, who are doubtless fruit hungry, year in and out. You can find places on the two sides and the back end of your garden thus for planting say six trees each of pears, plums, cherries, quinces, peaches, as they can be set in such positions eight to ten feet apart in the rows. If you desire more trees

you can plant a row through the middle of your garden, leaving ample room at each end for turning with a horse. Supposing the rows to be placed in the middle as above, now half way between this row, and say the west border plant a row of raspberries (red and black), and on the opposite side between the row of trees and the east border, plant a row of blackberries or grapes (*don't forget them*); and if hard pushed for room you will be tempted to plant the gooseberries and currants between the trees along the fence. You can now plow the garden as usual, except the space beside the raspberry row, where you will locate the strawberry bed, which will do more to brighten your home than many things that would cost one hundred times as much. Plant the strawberries eighteen inches apart each way if for hand culture, or three feet by eighteen inches if for horse culture.

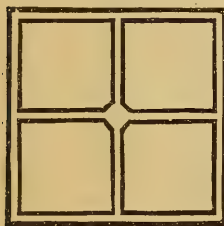
SEASON FOR PLANTING.

If you are laying out plans for a complete fruit garden where there has been none of any account previously. I recommend Spring planting. But if you simply wish to extend or complete what has already been begun, the long Autumn furnishes a leisure season for such work. Strawberries, if set in the Fall, should be transplanted as early as possible so as to get established before Winter, and when the earth freezes they should be lightly covered with straw litter to prevent freezing and thawing of the soil about them. Fall planted grapes, raspberries, blackberries, etc., should be similarly covered also to prevent heaving, and Fall planted trees should be banked with earth a foot high about their trunks. Such covering should be removed after the ground has settled in the Spring. Spring is the safest season for planting large fields, yet on account of the pressure of work then we plant largely in the Fall. Fall planting requires more labor in covering the plants, but we think it pays us to do so. If the soil is low, wet and liable to heaving, we would not plant until Spring. I do not enter into all the details, as they are given complete in The Primer of Horticulture in another part of this book. This Primer is of the greatest value to beginners, and is eminently reliable.

LAYING OUT A FRUIT FARM.

I will suppose that you are just beginning to feel that you have some experience in fruit culture and desire to lay out a ten-acre field for the different species, having selected it on account of its proper elevation, its natural or artificial drainage, its productive character when planted to corn or wheat, its nearness to villages or city, facilities for shipment or other considerations. We will suppose that the field has been in corn, potatoes or some other hoed crop last year, or that you have summer-fallowed it to kill weeds and rot the sod, so

it will not encumber the soil and prevent proper cultivation; that as Spring opened you have worked the surface fine, have then replowed, subsoiled, made the earth as fine as could be desired, and free from rock and stumps, and now wish to lay out the plat to the best advantage. You desire this field to be so surrounded and cut up by driveways that you can approach any part of it without interfering with any growing thing, for the purpose of gathering the fruit, for applying fertilizers, for conveying tools, etc. You also want the field divided into plats of convenient shape and size, one for each of the different fruits you desire to cultivate. We will suppose the field is square. We will first leave a driveway ten feet wide entirely around it. Then we will mark out the entire field both ways with an ordinary corn marker. Then we find the center of the lot and mark ten and one-half feet for a roadway through the field from east to west, and likewise one from north to south; running a one-horse plow in the line of the marker on each side of the



roads to mark clearly where they are. Now your ten-acre field is divided into four parts, with a roadway completely around each plat and around the entire field; and each plat is divided into squares and lines by the marker ready for planting. In one of these four plats you plant strawberries, in another red and black raspberries, in another blackberries, in the last currants, gooseberries, grapes, etc. Select the highest and best drained part for strawberries, as on such land late Spring frosts are not so liable to blast the blossoms, and the frosts of Winter are not so destructive in lifting the plants out roots and all, as sometimes occurs on low ground when not covered or shaded by straw or litter. Beware of low ground for any kind of fruit, especially if wet. While hilly ground is not always desirable, let the field be above the ordinary level about it if possible. We usually plant pear, cherry or apple trees along the fences on all sides of the field of small fruit. If this is your only field and you desire more trees, plant one or two rows through the center of each plat at points marked by the corn marker.

PROFITS OF FRUIT GROWING.

Will it pay? This is the first question a live man will ask when about to undertake any enterprise. As they would say in Dakota, "people don't go into business exclusively for their health." No, they want to make money, and why shouldn't they? I get many letters like the following,

which came recently, and which I copy for word:

Mr. Green—Dear Sir: I live in a city of 7,000 people, and as there is no one here who makes small-fruit raising a business. I thought I would try it. I have always wanted a small farm, for I love to work among strawberries, &c. I can buy a small farm, thirteen acres, not two miles from town. The land is sandy. Now, I would like your advice. Can I make small fruits pay? I have a good business, but it is not just what I like. It is roofing. I long to have a farm. Please answer soon, and oblige. Yours truly, W. H. K., Defiance, Ohio.

I reply to this man as follows: Yes, you can make small-fruit growing pay if you set about it properly and are willing to work. Yes, sir; nothing is more certain than that you can make it pay. There is no crop grown that can be made to produce so much profit from an acre of ground as strawberries; next raspberries and blackberries; next grapes, currants, etc. But do not forget that you are not at present an experienced fruit-grower, but a roofer, and that you have much to learn about fruit-growing. I would not advise you to drop roofing suddenly, and depend wholly on fruit-growing inexperienced. Stick to one trade until you learn another. Buy or rent your thirteen acres, make it your home, set out one-third of an acre of strawberries, one-third of an acre of black and red raspberries, and one-third of an acre of blackberries, currants and grapes. I will suppose that you are a man possessing some money, but not independent. Your fruits will bring you in no money the first year, unless by sales of plants, therefore I advise that you continue roofing until your income from fruits is large enough to meet your necessities. This acre of fruit is a small beginning, and I recommend small beginnings for those inexperienced. You can learn as rapidly by cultivating this acre as though you had ten or twenty acres and your mistakes will not be so serious. As you gain experience you can increase your plantation from the increase of your own plants. There are thousands upon thousands of just such places as Defiance, where no one produces fruit, and the supply is shipped from a distance, and where any intelligent man who likes to grow fruits can make fruit-growing pay well.

A man recently came here to learn about starting fruit-growing, saying he proposed to plant nothing but black raspberries. I told him he would make a mistake by omitting strawberries and blackberries, for if he planted all of these he would have months of continuous picking for his four children, instead of only two weeks, and they might pick all; while if confined to black raspberries, all ripening in so short a

time, he would have to employ other pickers. Then his customers for one fruit would be customers for the others as they ripened, and they would look to him for continuous supplies, and the same expenditure for baskets and crates would do for all. He saw the point at once and did as advised.

Directions for Transplanting.

PREPARING THE SOIL.

For Fruit Trees, the condition of the soil must be such as would be adapted to grow successfully farm crops. If the land on which you are to plant your trees is not in condition to support these, you can make it so by thoroughly underdraining and deep plowing. You may enrich it by turning under clover, applying barn-yard manure, or where it can be obtained, vegetable mold or muck without stint. The last is well adapted for producing a large amount of fibrous roots, and it is through these that the tree is fed. Muck can be used also on a mulch after planting. It keeps the soil cool and moist. Corn or potato ground is well suited for planting trees or plants, as the sods, which prevent good planting, are rotted.

PREPARING THE TREES FOR PLANTING.

Cut off the bruised ends of the roots, though not absolutely necessary, it is a benefit. The size of the top should correspond with the amount of roots. If few roots, cut back or thin out the tops accordingly.

PLANTING.

The hole must be large enough to receive the roots freely, without cramping or bending them from their natural position; the larger the better. Let the tree be the same depth it stood in the nursery, and not deeper, except in cases of Dwarf Trees. These latter should be set so that the point of union should come two or three inches below the surface of the ground. The tree being held upright, the finest and best earth from the surface should be carefully worked among the roots with the fingers, fill every space, and bring every root in contact with it. Set the tree as firm as a post, but leave the surface filling light and loose.

MULCHING.

This is done by placing a layer of coarse manure from three to six inches deep, extending one or two feet further in each direction than the roots. This protects the earth about the roots against drying or baking with wind and sun, retains to it the requisite moisture, and obviates all occasion for the practice, generally injurious of the watering of newly planted trees.

PRUNING.

The stem should now be put in condition for the formation of the top, by removing all the limbs to the point where it is desired

to have the top; then cut back each remaining limb, leaving from four to six buds of last season's growth. In the absence of any limbs suitable to form a top, cut the tree down to the requisite height, leaving the dormant buds to make the top.

This business of pruning vigorously at the time of setting, is generally a very ungrateful one to the planter, as it injures, for a time, the appearance of the tree to an unpracticed eye. It should, however, be unhesitatingly performed, all the branches to the extent of at least one-half the length of the previous year's growth being removed. Care should also be used to give the proper form to the tree. The head may be left high or low, as the taste of the planter may prefer, or as the nature of the tree, in some cases may require.

No stock planted in the fall should be pruned till the hard frost has left in the spring, but before the sap starts.

STAKING.

If the trees are tall or in exposed situations, they should be supported by stakes to prevent injury from the action of the wind. Staking is done in the best manner by driving two strong stakes firmly into the ground, one on each side of the tree, about a foot distant from it, and fastening the tree between them with bands of straw or other soft material, so that it may be kept in an upright position without chafing, till the roots obtain a firm hold upon the soil. We avoid the expense of staking by making the earth very firm, and by straightening if bent over by wind. But with very tall trees, staking is beneficial.

CULTIVATION AFTER PLANTING, AND TRAINING

Many cultivators, after taking great trouble and expense in selecting and planting their trees, fail of success by neglecting that after care and attention which is equally essential. Caterpillars and canker worms, grubs and borers, slugs and aphids, disease and blight, must be watched for, fought against and remedies faithfully applied. The wants of the growing tree must be carefully foreseen, and a faithful effort made to insure health and productiveness.

The requirements of pruning vary somewhat according to the kind of tree; we prefer, however, low training for all trees, for dwarf trees especially. The pruning should be done each year, so that no necessity may arise for cutting large limbs. Care must always be used to keep the head of the tree open and well balanced, cutting away the limbs which may be superfluous.

Trees should be trimmed as early as possible to the height it is intended the future head should be, that the cutting off of large limbs may not in future be necessary. This should be avoided when possible, as decay is liable to commence at the point of separation, and extend into the trunk. When such removal is absolutely necessary, the

wound should be carefully pared smooth, and a covering of paint or grafting wax applied, to protect it from the action of the weather.

Dwarf trees, particularly of the pear and apple, while young, require more pruning than any other kind of tree, in order to bring the top to a suitable form. For the first two or three years after planting, fully one-half the growth of these of the previous year should be removed, by heading in or reducing the length of each limb. The top limbs require to be cut back more, the lower limbs less, thus producing a more equal distribution of sap, and consequent vigor to the lower limbs with the upper. After the tree has passed say to the third or fourth year from planting, the requirement of pruning is only to keep it in symmetrical shape, and prevent particular limbs from taking a disproportionate growth. Limbs so inclined must be headed back sufficiently, and all superfluous wood upon the tree kept promptly removed. This regularly attended to, will obviate the occurrence of any necessity for amputating large limbs.

Those who are obliged to plant trees in fields of grass or grain, should see that all such are carefully mulched with coarse manure, and that the ground is kept loose and moist about the trees. A hoed crop is greatly preferable in such plantations for the first five years. After this time, standard apples, pears and cherries will grow and produce fairly in turf. Dwarf trees, plum and peaches should be thoroughly cultivated.

SUMMER PINCHING.

Those who are impatient to see fruit upon their trees, as is often the case, particularly with regard to trees tardy in coming to bearing, may expedite the fulfillment of their wishes by employing the process of summer pinching. In the month of July pinch off the young shoots; this retards for the time the flow of sap, and hastens the formation of fruit buds.

GRAPE VINES.

Require a dark, mellow, well-drained soil, deeply worked, and well enriched with a warm, sunny exposure. In planting give the roots plenty of room; spread them out not more than six inches under the surface, and settle the soil firmly around them. Soapsuds, sink water and urine are good fertilizers. Nothing better than leaves and trimmings of vines buried around the roots.

Pruning.—Vines, when set, should be cut back to within three or four buds of the root. In November, or early in the spring, before the sap starts, in open culture, they should be pruned liberally. In pruning rather tender vines, leave more wood than is needed, as some may be killed, and finish pruning in spring as soon as the leaves are nearly developed, when the life of the vine

may be seen. Do not pick off the foliage. The leaves, not the fruit, should be exposed to the sun. We urge this point, as thousands err here, and grapes are generally mismanaged. The two great errors are in neglecting to cut off useless wood in the fall or spring; and in depriving the plant of necessary foliage by close pruning in summer. To obviate overbearing, reduce the vines by close pruning, so as to prevent much fruit from setting. If too much sets, thin it in season, that the juices of the vines may not be wasted on what must be removed.

BERRIES.

Should have a strong soil and be kept under constant cultivation. Mulching is of special value. Raspberries and blackberries should have the old wood cut out each year, and new canes pinched off when two feet high. Strawberries should be mulched late in the fall, uncover crowns early in spring, remove mulch after fruiting, and spade in light dressing of manure. If set for fruit, keep the runners off. Currants and gooseberries need heavy mulching and pruning, so that new wood will have room to grow. The implement shown in the illustration will be found useful for transplanting small fruits.

SPECIAL RULES FOR FALL PLANTING.

All small fruits and small shrubs should have the earth banked up around them at least two-thirds their height the first winter. This prevents the frost heaving them, and sheds the water. This coating can be advantageously covered with loose manure. Large trees should be staked firmly; also have the earth banked up around them at least one foot or eighteen inches. These protections must all be removed in early spring, as soon as the frost has left the ground.

HOW TO WINTER TREES PROCURED IN THE FALL.

The practice of procuring supplies of trees in the fall is becoming more and more general as each season demonstrates its wisdom. It is a more favorable time than spring, because of the colder weather, and the lighter pressure of business with nurserymen, the freighting companies and the planter. Even when fall planting is not desirable by reason of the severity of the climate, the stock may be *procured* in the fall, and thus be on hand ready for the opportune moment in the spring. To insure success you have only to get the trees before freezing weather and bury them in the following manner:

Choose a dry spot where no water will stand during the winter, and with no grass near it to invite mice. Dig a trench, throwing out enough dirt to admit one layer of roots below the surface, and place the trees in it, inclined at an angle of forty-five degrees or more. Widen the trench, throw-

ing the soil among the roots in position. Place another layer in the trench, reclining the tops on the others, and so on until all are in the trench. Then finish by throwing up more soil. It is also well to bank up the earth around the sides to insure more thorough protection. Care should be taken to fill solid all the interstices among the roots. In the spring the roots will be found to have formed the granulations necessary to the production of new spongioles and when planted at the proper time will start to immediate growth. Use only finely pulverized soil.

If the trees are frozen when received, they should be buried immediately in the earth, tops and all, and allowed to thaw in this condition. These transplanting rules, not my own, I have amended and corrected. I do not know who should have credit.

What Poor Men Should Do.

I often ask myself as I pass a small farm, located near a village, "Why does not this man raise fruits?" If I were in his place I could make four times the money he receives." But at a second thought I see (1) that the man has no experience with fruits and that he must consume some time in learning their habits; (2) that it would cost him something for plants and trees, and that he may not be able to buy them; (3) that very likely he requires the produce of every acre for the maintenance of his family from month to month, and that if he plants fruit he might run short of money before they came into bearing. The proper thing for a person so situated would be to invest \$5 or less in strawberry, raspberry and blackberry plants, get experience in cultivating them, and increase his planting with plants of his own growing.

How Farmers May Begin.

Young men adapt themselves to new occupations more readily than those older, therefore it is well to give one of the boys an opportunity to begin fruit-growing. Set aside a field for that purpose, and let him manage it. You will be surprised to learn how quickly he catches ideas, and the rapidity with which he masters the situation. Fruit culture conflicts with farm work at times, but in this way each could attend to his own affairs. Fruit-growing, industriously and intelligently pursued, is now and ever will be a profitable and delightful occupation. I know of no means by which the soil can be made to yield so profitably, but it requires closer observation and study, and more thought and attention than is ordinarily given to farming. Fruit-growing for drying may be profitably pursued in any section where the soil is suitable. Black-cap raspberries are the most profitable of the small fruits for this purpose, the berries

netting as much profit when dried as when sold fresh. A dry house suitable for this purpose can be made for \$15 by an ingenious person.

My friend began fruit-growing on a farm of 100 acres without experience. He rented to a neighbor on shares for grain-growing, all but ten acres. He purchased 1,200 strawberry, 1,500 raspberry (red and black) and 100 blackberry plants; 120 grape vines, a few currants and gooseberries, 200 peach, 300 apple, 100 pear and 50 quince trees, costing altogether \$100, and embracing the leading varieties. The 300 apple trees occupied six acres. Excepting grapes, quinces and pears, all the above fruits were planted either in or between the rows of apple trees. He layered grapes and raspberries. The strawberries and some other species multiplied fast, thus the second year he had a stock of plants of his own growing for further planting. Thus he extended the enterprise gradually each season, buying only a few improved varieties, and extending his pear, peach and quince plats.

The first season there was no income from fruits. The second year his fruit sales amounted to \$23, the third year to \$141, the fourth \$354, the fifth to \$576, yet the quinces, pears and apples had not arrived at bearing age, the peaches bore one season, the grapes were just ready to give returns, the strawberry crop had been cut short two seasons by late spring frosts, and only eight acres had been occupied. The fruit sales had been made at extremely low price—5 to 7 cents per quart—and much work had been done in a roundabout manner. It will be safe to estimate his receipts annually from the ten acres, when all the trees are of bearing age, allowing for occasional failure of some species, at \$1,000, from which, at a rough estimate, \$400 should be deducted for labor, gathering, marketing, etc. These figures are not startling—they simply represent what the novice may reasonably expect from similar venture. One experienced could do much better, for it is not impossible to secure \$1,000 from one acre in fruits.

The Selection of Varieties of Fruits

This is the question that is asked on all sides, and is one of the greatest importance. People say they look over the catalogues and are more perplexed than when they began, asking what they shall do, having no experience of their own. My advice is, to get the opinion of the most reliable fruit-grower in your vicinity, if possible, for those living hundreds of miles away cannot so well take into account the conditions of the locality, and often only actual experience in your locality will decide what varieties are the best. If no neighbor is well posted you must get advice from a distance, and experienced men even a thousand miles away can help you much, by

recommending varieties that do well everywhere. Do not plant many varieties. Two or three varieties of each species is often enough, to begin with, at least. It would be folly for me to attempt in this book to give a list of varieties for each state. Remember that those varieties suitable for the north often fail in the south, and that those that succeed in the east often fail in the far west, and *vice versa*. If you will state clearly where you are and what you desire to do, enclosing stamp, I will gladly advise you by a personal letter.

Uncertainties of Fruit Culture.

The uncertainties of life are *not necessarily* calamities. To be certain of the future leads us to be watchful, diligent, prosperous. Certainties induce us to lie back complacently—uncertainties urge us to renewed effort. Uncertainties give prizes to the practical, the diligent, the progressive. I mention a few:

1. The uncertainty as to which may prove to be the best varieties now and in the future. It would seem probable that the masses will consider quality more and beauty and quantity less.

2. The remarks that may be indulged in over a new variety by those not posted.

3. The causes of the diseases of fruit trees and plants and the remedies. Prescribing for them is like prescribing for babies—they have no speech and cannot tell us where the trouble occurs.

4. Whether, considering the growing interest taken in small fruit culture of recent years, large fruits will ever again maintain their former imposing supremacy.

5. Whether there is any limit to the improvement of varieties.

6. Regarding the different effects of frost on plants in the same field. An elevation of one or two feet often appears to save them, and plants on the same level with those destroyed are often saved, through conditions of the soil about or beneath them. I have found the blossoms of mulched strawberries more seriously injured than those unmulched, where the soil was kept loose.

7. The astonishing quantity of fruit a community, whether rich or poor, can be educated to buy and eat.

8. Whether new varieties of fruit approaching the ideal in one direction tends to weakness or defects in another.

9. Whether the fruit or the seed is the primary object of nature.

10. The cause of occasional late strawberry blossoms being pistillate on hermaphrodite plants.

11. The cause of the entire destruction of fruit germs after blossoming, in the apple and pear.

12. Why seedlings are apt to succeed best where they originate.

Certainties of Fruit Culture.

There are as many certainties connected with fruit-growing as with other enterprises. I sometimes think that greater certainty would bring less profit to those who strive with heads and hands and deserve to succeed. To succeed without effort is not in the nature of things, nor for our greatest advancement. We struggle for success, and not only secure it, but greater strength to achieve other victories. I will notice a few certainties:

1. It is certain that if we attend to the wants of our orchards they will beautify our homes and make them attractive to our families and neighbors.

2. That apple growing is profitable for stock feeding if proper varieties are selected.

3. That our occupation is healthful not only to those who pursue it, but in its effects on those who consume our product. Fruit growers do more to bankrupt the grave-digger than doctors.

4. The change from grain growing to fruit growing is a great rest for the soil, enabling it to recuperate. Fruit growing does not so rapidly exhaust the seed producing element.

5. Fruit growing does not beget laziness. Its promise of beautiful tinted specimens and rich clusters urge us to do our best, and having done this we have no time for idleness.

6. That we approach improvement in varieties of fruit as we approach great inventions. One successful invention leads to another. One valuable fruit leads to another more valuable.

7. That the improvement in varieties of fruit appear to come in groups. The Souhegan family are of the Doolittle type, the Gregg family of the Mammoth Cluster type. Worden, Moore's Early and other grapes are of the Concord type. Amsden, Alexander, Waterloo and other peaches are of Hale's Early type.

8. That there are other methods than through seedlings by which new varieties may be secured. We ignore the fact that new varieties originate from sports. It is time that we recognize this, and derive all the benefit possible.

9. It is certain that our methods of fruit-growing have not reached perfection. Consumers are paying high prices for fresh fruits. Compare the price paid for our fresh fruits with those paid for raisins, figs, etc., put up and sold at much greater expense.

10. It is certain that the people of this country at large are insufficiently supplied with fruit. In traveling two thousand miles across the country one's view from the car windows would impress the opinion that this was not a fruit-growing country. While there are many who appreciate fine

fruits, the average ruralist is ignorant, blind, indifferent regarding them.

11. That many fruits appear to ripen faster during the night than during the day, yet the sunny side ripens sooner than the shady. The closer fruits are to the earth the earlier they ripen.

12. If we find birds no larger than our thumbs struggling with destructive worms in our nurseries we need no prophet to assure us that they are friends.

13. That if we apply fertilizers to fruit indiscriminately we are in the position of the farmer who feeds his cattle without observing their likes or dislikes—their wants or abhorrences.

14. That one significant evidence that the interests of fruit-growing are alive and advancing is that the veterans who went forth proclaiming a new dispensation, the men who laid foundations, whose zeal gleamed brightly, and whose enthusiasm was kindled before many of us were born, are appreciated and honored.

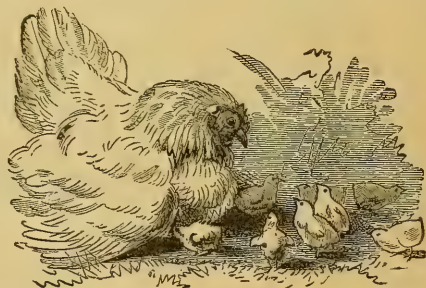
Possibilities and Conditions.

Fruit growing for market is comparatively a new industry, even here. Seventy years ago Western New York was a forest. Our pioneers became grain growers through necessity. The children of this grain-growing people have followed the footsteps of their fathers, their cry being continually, "Wheat, wheat! by wheat we live or die!" (yet many of them died through fat pork). Thus it is, that the fertile valley of the Genesee has gardens more destitute of fruits, than many of the Western states. Our grain-growers who have gone west have been drawn out of the ruts of their fathers; thus their gardens there are more often fragrant with strawberries on each returning June.

In few branches of industry have there been greater developments than in fruit-growing. Our pioneers had no fruits except

neighbors, and with it the evaporating boom, itself a revolution. With these developments, were opened new fruit producing territories, not dreamed of in the earlier days, and many of the Southern and South-western states began to plant early fruits for northern markets. Western New York has long since been shorn of her supremacy for wheat growing—we will do exceedingly well if we maintain our present status for fruit-growing. I wonder that we do not give more attention to small fruit culture. We should have ice-houses in which to store berries as soon as picked, and refrigerator cars in which to ship.

The horticultural societies of the West and South-west are numerous, and doing good work. But the great mass of our fruit growers are not awake to the possibilities of their vocation. They stay at home nursing the fallacy that they have learned all worth knowing. Here the question arises, "How can instruction best be given in fruit growing and ornamental gardening?" Not by preaching, for those will not come to listen whom we desire to benefit. Not through the press, for our papers are laid aside unread, by those not interested in the subject. There is but one effectual method,



and that is by example—object-teaching. Let any fruit grower lay out a fruit farm among grain growers, and they will soon learn through their eyes and mouths, what preaching or editorials would never have taught. One after another will transform a wheat field by planting therein the various fruits, until the epidemic becomes general. There is one other method I will propose: Let us announce a cattle show and horse race in the rear of a fruit farm during the ripe berry season. If the visitors would not neglect the show proper in admiration of the berries, they would not be human. And after learning how bountifully the earth produces these luxuries, they would become willing converts.

There are many problems for progressive fruit growers. There are men in every State on the continent who are studying, experimenting, investigating, digging up advanced ideas. How shall individuals be benefited by this widely separated work, if not by communication through the press, by attendance at horticultural meetings, or through reports of such gatherings?

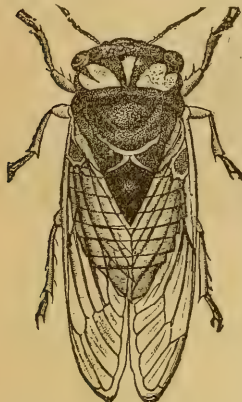


those of stump lots, marshes and broken forests. First a taste for fine fruit had to be acquired. This taste is yet crude, but far in advance of the past. Next came methods of canning. It is but a few years since a pound of sugar was used to preserve a pound of fruit. Next came experiment in cold houses, not yet perfected. Then followed the heavy demand from our European

Insects Injurious to Fruits— Remedies.

BY CHAS. D. ZIMMERMAN.

Whenever a strong poison can be applied, Paris green is the most effectual. The exact amount can only be determined by experience; from a teaspoonful to a table-spoonful of the poison, to a barrel of water are recommended. To use it dry, mix one



pound to twenty-five pounds of flour or plaster. London purple is cheaper and as effective. It is finely powdered, and more flour can be used than for Paris green, about one to fifty, or in water one pound to from 100 to 200 gallons of water; it is not soluble. Nothing is more deadly to insects than oils. Insects do not breathe through the mouth, but have respiratory organs,

generally situated on the side of the abdomen; these organs are obstructed by oil, which is the usual cause of death. Kerosene is the most deadly of oils, but is injurious to vegetation, and should only be used diluted. To mix oils with water, first combine them with milk, then dilute to the desired degree with water.

Insects that Trouble Large Fruits.

CODLING MOTH.—Paper bands, applied by June 20th, and examined every ten days until August 25th, and again after all the fruit is gathered, or the Paris green application already referred to.

IMPORTED OYSTER-SHELL BARK LOUSE.—Apply pure raw Linseed Oil in June.

PEAR AND CHERRY TREE SLUGS.—One or two dustings of air-slacked lime is a good remedy. There are two broods, one in June and again in August.

PLANT LICE.—Heavy and continued rains destroy them. Tobacco water is one of the best artificial medicines.

TENT CATERPILLAR.—Readily destroyed by twisting the nests into a rough stick and tramping it under foot, on a cool day or early in the morning when they are at home; and prevented by cutting off and burning the twigs in winter that contain the mass of eggs laid in circles on them.

PLUM CURCULIO.—This breeds in nearly all store fruit, and disfigures but does not breed in apples and pears. No better remedy than the jarring process, if persisted in. Commence as soon as the fruit has set and jar three times a week for about three weeks; it need not be done early in the

morning, as we have been told, as all curculios "play possum" when jarred and are readily taken.

BUD WORMS.—These two small moths and perhaps others, are very troublesome in the orchard and nursery by destroying the buds and small leaves just as they are about to expand; they are very difficult to destroy by any poisonous liquid, as they tie the small leaflets together to protect themselves. Hand picking is all I can suggest, but a better remedy or preventative is wanted.

PEACH TREE BORER.—The eggs are laid at the collar, during July, August and September by the day-flying moth, resembling a blue and yellow wasp. Cut them out with a knife and prevent with tarred felt as commended for the apple tree borer.

CLIMBING CUT-WORMS.—These have been complained of as having destroyed fruit buds during the night on trees. Try anything that will prevent their climbing the trees, like the rope and tin bandage, as recommended for the canker worms.

FLAT-HEADED APPLE TREE BORER.—Found under the bark of apple and white oak, occasionally on other trees. As it attacks diseased trees principally the remedy is to have healthy trees only. Apple trees that are sunburned are very subject to its attack. Use the knife and wash with soft soap about the last of May.

ROUND-HEADED APPLE TREE BORER.—The female beetle lays its eggs at the collar of apple and quince trees, from June 15th to July 25th. Cut out the larvæ with a knife, and prevent egg-laying by placing a sheet of tarred roofing felt around the collar, slightly in the ground and about eight inches high, tied at the top.

CANKER WORM.—The females are wingless and crawl up the trees on warm days in winter and spring to deposit their eggs. A rope three-fourths of an inch thick, cut long enough to reach round the tree and fastened with a couple of nails; over this a tin band three inches wide, placed so that the rope will be in the middle of the tin will prevent their ascending. [Paris green water (a spoonful of paris green per barrel) applied to the foliage by spraying with a force pump is an effectual remedy. I have tried it, intending to give two sprayings, but found once enough to destroy the pests.—C. A. G.]

Insects Injurious to Small Fruits.

The strawberry worm is the larvæ of a small, jet black saw fly. The eggs are laid in the leaf-stalk about the middle of May, those of the second brood in July. Readily destroyed by hellebore or alum-water, one ounce to a gallon of warm water.

GOOSEBERRY FRUIT-WORM.—The larvæ of a small moth which lays its eggs on the fruit as soon as they have blossomed; one larvæ often destroys ten to fifteen berries. Hand picking appears to be the only remedy.

WHITE GRUB.—The larvæ of the May beetle; very destructive to strawberry beds



planted on lands where grass was grown less than three years previous. The eggs are usually deposited on grass lands or on old matted strawberry beds, and as the grubs are three years coming to maturity, such lands may be used accordingly. The beetles are sluggish during the daytime and can easily be shaken on to sheets from trees.

IMPORTED CURRANT BORER.—This is the larvæ of a transparent winged moth, and is much more troublesome than our native species. Cut out and burn all infested branches.

GOOSEBERRY SPAN-WORM.—The larvæ of a pale yellow day-flying moth, of sluggish habits and easily caught in a net. Use white hellebore on the leaves.

IMPORTED CURRANT WORM.—The larvæ of a yellow saw-fly, easily destroyed by white hellebore, and I am told that alum dissolved in warm water, an ounce to a gallon, is very effectual. There are two broods.

RASPBERRY TWIG GIRDLER.—A small beetle, which deposits an egg near the end of a twig and then girdles it. Cut and burn the twigs. Tree crickets are sometimes troublesome, they lay a row of eggs lengthwise into grapevines, also in some trees and shrubs. Cut and burn the twigs.

STRAWBERRY LEAF ROLLER.—The larvæ of a small moth, which rolls the leaves about itself for protection while feeding. Hand picking may pay on a small patch, or blow under as soon as picked and set anew in a remote place.

GRAPE PHYLLOXERA.—No efficient remedy has, as yet, been discovered, although a prize of three hundred thousand francs has been offered by the French government. Mr. Sidor Bush states very clearly that the Phylloxera has existed on our native vines

for centuries, and does not destroy them, but may injure and weaken them. It does kill all European varieties of grape vines. American vines injured by Phylloxera would probably revive by applying fertilizers.

GRAPE VINE FLEA BEETLE.—This steel blue beetle has a great notion for nipping the vine in the bud; its brown shiny larvæ are also great feeders on grape leaves in the early summer. The beetles are easily taken by jarring the vines early in the morning or on a cool day, over an inverted umbrella. For the larvæ apply air slacked lime.

How to Make Money.

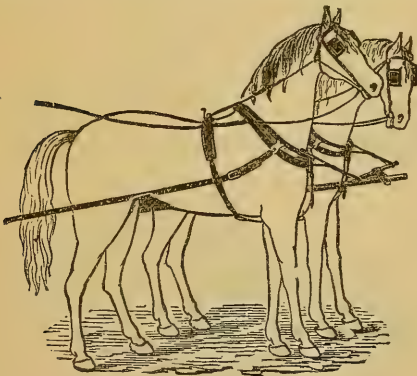
This is an interesting subject. How can it be accomplished? First you must make an *effort*—a **BIG EFFORT**—exhibiting all the



push and perseverance there is in you, no matter what the undertaking may be. The Almighty has planned that money cannot be made without a struggle. Even the swindler and impostor have to make an effort to entrap their victims. Having made an effort, persist in it. Push! push!! push!!! Never give up nor leave the enterprise you have considerably selected, for others that for the moment may appear more promising. A great cause of failure is the mistake people make in choosing a vocation, and in

ever afterward trying to change for the better. Such changes are dangerous and cause serious drawbacks. If every young man could select his proper vocation when he begins life and stick to it persistently until old age, the number of successes would be increased a thousand fold. Select an honest business. None other pays in the long run. Select a business whereby you can most benefit your fellow men. Do not do this simply from kindness of heart, but for the further reason that such kinds of business *pay best*. Money is made by supplying wants—the more important the want the better the chances of success. Ponder this point well. Supposing you are possessed with the idea that the homes of some Western settlement should be ornamented with fine paintings, and forthwith set up a studio and offer them for sale. You would soon learn that the good people could get along very comfortably without the paintings, and that you would not supply a “long felt want.” There are communities where paintings will sell, but you have not located wisely for that pursuit. If you had offered boots and shoes, axes, hammers, ploughs, cultivators, etc., you would have found customers. Therefore study what the people need, and how you can best supply it, always considering your natural tendencies, yielding to that which best suits your individual taste to a certain extent.

ADVERTISE—“How?” you ask. There are a thousand ways. You can advertise by selling cheap; by selling high for superior goods; by driving handsome horses (I



don't advise it); by keeping a tidy and inviting place of business; by attractive signs; by unusual attention to patrons; by selling some staple down below cost; by a good pew at church; by hand bills, dodgers, newspapers, balloons, painted fences and rocks, and other devices not yet dreamed of. But whatever the method, I advise you to ADVERTISE. If you have but little capital, do not spend it all for space in the newspapers. Go moderately; you have much to learn, for advertising is a fine art, requiring long experience to attain the best success. It

may be claimed that all successful men advertise. Doctors often say they do not advertise, but they do. There are numerous ways they can do it without a line in the papers. Well I remember a new doctor that came into Rochester and drove a two-wheeled yellow cart, when other such conveyances were never seen. Everybody wanted to know, “who is that man?” He made himself known at once.

Most people begin with but little money. Keep yours in your business. Do not on the start invest it in even a house to live in, for it will be much better for you to rent one and have the money to turn over and over again in trade. You will find numerous temptations to invest to advantage outside your business. Do not do it until you can afford to lose what you thus invest. Ponder this point—it is a vital one. I have been through the mill and know whereof I speak.

Limit your expenses to what you can afford. It is not necessary to live expensively in order to live well. Depend on strengthening your credit by prompt payment of all engagements more than by outside display in living, dressing or equipage. Figure closely on all details, but when you see a good chance to benefit trade be lavish; don't scrimp when the investment of \$1 will bring \$10. Keep watch of the times, and ahead of the times—herein lies one of the secrets of success. The man who comes slouching into the dock after the fast boat has departed always gets left. Don't get left, I implore you. Keep an eye out from the mast-head at the weather. If it looks squally, take in your sails. If all is promising put out every inch of canvas. Do not fear to take some risk. If you take no risks you cannot make a great success; but govern the extent of your risks by your ability to withstand loss.



The business I have selected for life is fruit and tree growing. It is a healthful business—consider that point. What is life worth to a man who has no stomach? I tramp about in the fresh air and sunshine and can digest tenpenny nails, whereas when cooped up in an office, I was distressed continually with the most simple food. It is an honest business. My children need not blush for me, and my patrons are not injured by what I sell them. It meets that “long felt want” that all are seeking for. The people are not well fed with fruits; the face of the earth is barren of these necessities where it should be laden with plenty. It is a profitable business—if not, how would the printer get paid for those car-loads of

papers and catalogues, and the army of laborers for all their picking, hoeing and digging? But you need not choose these pursuits. You may have been designed for a doctor, a lawyer or an inventor. If you were so designed, stick to it, my friend, though the heavens fall. Our nursery is simply an outgrowth of the fruit farm. People found that we had fine fruit and wanted the plants. From a local demand followed a trade with all parts of the United States that astonishes us. Any fruit grower having business ability may work up a profitable plant trade, gradually extending to trees and ornamentals. My advice has always been, begin slowly, gradually extending as you gain experience, no matter what may be the business.

Do as you agree; keep your pledges. Nothing weakens faith in men so much as quibbling, beating about the bush, and attempts at evasion of promises. I have known men to damage their reputations irreparably by backing out of a bargain, or breaking faith to save a few dollars. Do not sell yourself so cheaply. No; do as you agree and abide the consequences. You will thus soon learn to be exceedingly careful what you agree to do, and you will sel-



dom be caught napping the second time when apparently profitable opportunities for ventures are offered. At the present moment a crisis has come to the farming community. So many have produced wheat and corn the markets are over-supplied. Look around you and see if some form of product can be grown that every new comer does not attempt. If your community is buying berries and other fruits at good prices, or purchasing them from a distance, rest assured that there is an opening for money-making, if you have a taste for such work, by devoting yourself to fruit growing. There are many parts of the country where berries, etc., bring extravagant prices. Do not rely on such prices continuing long, but accept the situation and begin. This book was printed for your especial benefit.

How to Lift the Burden.

My son, put that log on the wagon.

I cannot father. It weighs many tons, and exceeds the strength of a hundred men.

You can put it on the wagon and I will teach you how. Chop and split it into

lengths suitable to your strength. Now let this be a lesson to you. All through life you will find heavy burdens to carry, heavy tasks to perform. Do not inspect them in bulk and become disheartened, neither grapple and attempt to master them with one effort. Perform what your strength will permit—a little each hour—each day. You will gradually become strong, and meet with success in the end. By attempting to lift a heavy log at one effort, you might injure yourself beyond recovery. But by lifting a little at a time, you would, in a life time, move more logs than could be stored in a town-ship. Great success in life is secured by knowing your strength and lifting accordingly. By continuous and persistent effort rather than a momentary struggle.

There is another way by which you can move heavy logs. There are many inventions designed for this purpose, the existence of which you do not suspect. In some instances you are only required to attach the grappling hooks, and the burden is borne wherever you desire. Remember that in all undertakings in life there is one way to proceed much better than all others. Investigate closely, assuring yourself that you are working by the best methods. Otherwise you will be lifting the log without appliances. Only the best methods lead to success in this progressive and competitive age. If you cannot discover these methods, you will see your rivals pushing ahead. You will be outrun in the race.

A Propagating Bed.

There are few nurseries in which the soil is naturally in the best condition for out-door propagation by cutting, etc. We remember a bed at Rochester made 40 years ago by drawing 100 loads of sand on a small plot, and continually enriching and mixing it with the surrounding soil. Every year the bed bore a wonderful crop of vines, the stand being something remarkable. But an examination would convince any person why the cuttings succeeded so well. The conditions of moisture and porosity were present, and the most careful attention was given. Any one may prepare a bed equally desirable, smaller or larger as their wants demand. If only designed for one year the expense would be considerable, but as it can be used thus forever, the cost is too small for consideration. If you have no sand to mix with your clayey loam use muck—say about as much muck as common soil, and mix well by plowing and cultivating, or spading. Before applying the sand or muck and after plowing, it would be a great advantage to burn piles of brush on the soil. The benefit derived is not only from the ashes—the burning of the soil is an advantage. Apply ashes, phosphate and well rotted manure freely, and have all well mixed with the soil before planting.

Berry Harvest.

Wheat harvest brings in a busy season, but the berry harvest is one of greater anxiety, as small fruits are perishable, and must be sold at once as well as gathered. Begin a month in advance to get crates, boxes, picking trays, etc., on hand, and build new packing houses, where necessary.

These are often rude affairs. We have seen a pole borne by two crotched posts, on which boards rested, one end of the boards lying on the ground, answer in keeping off sunshine and storm. Sometimes only the shade of a large tree is relied on. But sudden and severe storms are liable to occur, and most often the houses are sixteen feet square, with a narrow passage way on one side through which only one row of pickers can pass at a time to deliver the berries, thus avoiding confusion. It should admit the air freely. On large fruit farms they must have many of these packing houses at convenient points. They must also have cheap cabins built in which pickers from a distance can sleep and cook.

It requires some experience to manage berry pickers, especially when a large number are employed. They are easily influenced to stop work at a critical moment, by some one discontented picker. Prevent this by making contracts with them for the whole season or no pay. It is useless to try to keep accounts with pickers, for if they get the notion that your accounts are not what their memory calls for your books will be worthless to convince them, and one dissatisfied picker will torment you worse than an army of ordinary creditors. Work entirely on the ticket system and it will save you vexation of spirit. But you can have tickets, each one of which will cover 100 quarts picked, to pay out when liable to run short of small tickets. There are many kinds of tickets used, but mostly small ones with one, three and six quarts marked on them, or one, two and four, corresponding with the number of quarts the picking trays hold. Mr. Samuels' method is as follows: "He has a card four inches in length by one and a half inches wide, on which a number of figures, are printed to represent quarts, with smaller figures below giving the sum of all above. The larger figures are punched out with a punch like a railroad conductor's, as the berries are brought in. A man stands at one of the packing house doors for this purpose, and punches out numbers, representing the quarts picked, attends to the berries and gives instructions about picking. This requires an experienced man, and one who is thoroughly honest, as it is easy to punch out figures representing more than is brought in by some favorite."

Govern the pickers with a firm hand. There is no other way. They will soon learn whether you intend "the rules" shall

be obeyed, and whether you are in earnest in your commands. Rest assured that every advantage will be taken of weakness in discipline. No less than two persons can manage a lot of pickers—often many more, according to the number employed. One person must be ready to receive the fruit as it comes into the fruit house, pay out the tickets, and place the fruit in crates, or, where it is assorted, as the case may be; the other must be moving about the berry field continually, seeing that the pickers stick to the rows assigned them, that they pick clean, fill their baskets and put in no rubbish. Few men are suitable for this work—it requires a brigadier general.

We recommend that every large berry grower have rules printed on cards, and that they be given to each picker when he is invited to begin work. We shall use these rules on cards that represent one dollar due the picker, which will enable us to take up the smaller tickets. It will be worded thus on the back of card: When properly signed by us this ticket will show that one dollar is due you at the end of the picking season, providing you have worked faithfully to the end. If you lose this ticket you lose your money.

Rules for Berry Pickers.

1. No person is permitted to stop work for the day without permission.
2. No children under eight years of age, no troublesome, complaining, dissatisfied, profane or improper talking persons allowed on the premises.
3. Those who eat most berries and talk most accomplish the least work and are not wanted.
4. Each picking tray will contain its quota of boxes, and no person will be permitted to take more quart boxes than the picking tray holds.
5. Tickets will be given for each quart picked. *If you lose these tickets you lose your money.* Do not trust others to count your tickets. Keep your tickets in packages of one dollar each, so as to have them convenient to be proved when you are paid.
6. Pickers will be paid at the end of the raspberry season for picking both raspberries and strawberries, and not before. It is best for you to get your money all at once for then you know how much the season has brought you, and it is not consumed by piecemeal. We can not be bothered by paying pickers as they happen to want change.
7. If you can not pick all the berries in the row, if you can not pick without bruising the fruit, or trampling on it; if you can not fill your boxes properly, or keep the fruit free from leaves and rubbish you will be discharged.
8. You are not paid to make fun, to tramp on boxes and trays, or make a noise.

All must be quiet and orderly or you will prevent others from working besides losing your own time.

9. Any person found creating dissatisfaction among the pickers, by word or act, will be banished and never permitted to enter the place again.

10. If found picking from other rows than that which has been given you to pick you will not be paid for picking such berries.

11. It is understood and agreed that all persons employed to pick our berries shall remain with us, picking whenever and as long as their services are needed, and that should they stop picking sooner (unless on account of sickness), they forfeit all the money they have earned. This is understood to be a contract between us and every picker, and will be enforced. It is assumed also that you agree to keep all the rules herein laid down, and abide by all requirements above set forth. If you can not agree to abide by these rules do not begin work. All tickets must be presented for payment within ten days after the close of the picking season.

Marketing Fruits.

We publish elsewhere facts regarding the loss incurred in shipment of foreign fruits. If the losses of domestic fruits were capable of being shown it would astonish the reader, for there is often a woful lack of judgment or experience in putting them up and sorting, and often inattention on the part of the persons to whom they are sent for sale. Parker Earle is one of the most successful shippers. He stations men at important points to attend to shipments and sales, not feeling satisfied to trust everything to men employed by others. The selling requires as much attention and experience as growing. His fruits are picked before getting fully ripe, are assorted, packed to stand rough usage, and open at the end of the journey in tempting style. He ships in refrigerator cars, and stores in cold houses as soon as picked. We often see his fruit in the Rochester market looking as fresh as when first picked in southern Illinois.

We find the home market is most profitable, and would advise all to make every effort to sell as near home as possible. Many people send fruit far away to market not knowing that larger profits could be made by manipulating and encouraging home sales. Learn what your home market requires and grow fruits to meet it. *Make a home market.* Grow berries so large and tempting they will sell themselves. You will find that the more you sell the more you may sell. Your customers will eat berries from habit, and consume bushels where formerly they consumed quarts. For instance take a locality where

many persons are growing fruit on a large scale, and you will find more berries consumed there than elsewhere, and more easily sold, for the people have learned their value and formed the fruit eating habit. Distant shipments entail loss at best, crates are lost or smashed, there is an unexpected glut in the market, trains are delayed, or unlooked for events transpire to cut short profits. The home market is the best, rely on it mainly. If compelled to ship make arrangements beforehand with men whom you have found (on inquiry), are reliable. Never send to a total stranger, of whom you know nothing. Let one man at each point handle all you send to that place. Do not disappoint him when he expects a shipment. Your fruit will soon get a reputation with his customers, and if superior will command better prices than if sent to different firms, who know less about you or your goods. If shipping a large lot telegraph the amount and the hour of shipment so that he may be making a sale for it before its arrival. There are many growers who sell entirely through commission houses, and who are well satisfied with the results. But remember it requires experience to pack and ship and make it pay, and that for the novice the home market is the mainstay and safe anchor. Strawberries intended for distant shipment should be picked every day, and raspberries every other day.

Ten Questions Answered.

Question 1. Is fruit-growing profitable. Answer. It is profitable if conducted with skill and perseverance. Without experience we cannot be skillful. Without perseverance we can accomplish nothing.

Q. 2. If fruit growing is profitable why do not rural people more generally engage in it?

A. The mass of ruralists have been born and bred farmers. Their entire attention has been given to grain growing, to stock, etc. They know no more about fruit growing than about manufacturing boots and shoes or woolen goods. They have not placed themselves in position to learn about fruit growing. But where fruit farms have been successfully established among farmers they have not been slow to learn that fruit growing pays best, and such farmers often pick up enough information to begin for themselves in growing fruit.

Q. 3. Is fruit growing more generally pursued than formerly?

A. Yes, especially small fruit. Twenty years ago small fruit growing was scarcely pursued as a business, the supply coming largely from wild bushes. There is ten times as much grown now as ten years ago. Each year increases the supply and demand.

Q. 4. Does not the increase of planting depress the price of fruit?

A. It has not thus far. Since canning and evaporating began the prices have stiffened, and the gluts in the markets, so frequent of old, are seldom experienced. The more abundant the supply of fruit the more people form the habit of eating it.

Q. 5. Is there not danger of over-production?

A. There would be danger were every part of the country adapted to fruit culture. Considering the fact that but a small part of the United States is well adapted to give profitable returns, there appears to be but little danger of a permanent over-supply. Not so much danger as there is of an over-supply of wheat, for wheat can be grown over a much larger extent of country.

Q. 6. Are people going into fruit culture intelligently or blindly?

A. There was a time when men rushed into it blindly with exaggerated expectations, not knowing what to plant or where to plant. They were alike ignorant of varieties, the habits of species, the peculiarities of soil necessary and other important questions. These men failed disastrously. Another class have begun the work, who have fitted themselves by experience and observation and never in this country have we had so intelligent and competent a class of fruit growers as to day.

Q. 7. Which branch of fruit culture is most profitable?

A. It is difficult to state. What is most profitable to-day may be the least profitable a few years from now, and what is most profitable in one locality may be the least so in others. The wise course appears to be this: plant not all to strawberries, or to pears, or any one thing, but everything that your market calls for. The season opens with strawberries, then comes raspberries, blackberries, currants, gooseberries, apples, peaches, pears, plums, quinces. Thus you have something to market perpetually, and if one crop fails you do not feel it as you would if all your time had been spent on one specialty. Your market should be your guide as to what you should grow.

Q. 8. Is fruit-growing hard work?

A. Physically it is not nearly so hard work as farming. Mentally it requires more effort.

Q. 9. What soil is best for fruit culture?

A. A farm having both sandy loam and clay loam would be preferable, as pears, plums, apples and some other fruits would do best on clay loam, and the small fruits best on strong, sandy loam. In all cases avoid stiff clay. I would not take such land as a gift for fruit culture.

Q. 10. What would be the chances for success of an inexperienced city man, or a retired clergyman, at fruit-growing as a business?

A. His chances would be small. He would be likely to have fanciful and exaggerated

ideas of the profits, and an inadequate conception of the amount of work required. He would in other words not be practical. But many such men have succeeded, and will again. If a man has the right metal in him there is no such word as fail in any enterprise he undertakes.

The Marlboro Raspberry.

Probably no raspberry has ever been introduced in this country about which so much will be said as the Marlboro. Shares of this variety were sold in the Spring of 1883, all being bound by contract not to sell before the Fall of 1884. One of the best indications is that most of the shares were taken near where the berry originated, and where it is best known, and by fruit growers for their own planting. The Marlboro is a bright red raspberry, large size, firm and fair quality—we do not consider it equal to the best in quality—a firm shipping berry is seldom of the best flavor, as quality and softness or juiciness often go together. The quality is better than Brandywine or Reliance. We may think better of its quality on further acquaintance. It is claimed to be the earliest variety to ripen—we have not tested this point. It endured the past severe Winter here, the canes coming through in fine condition, to the tips, without any protections. It is one of the most vigorous growers, making strong, stocky, reddish canes, with very prominent buds.

We stand ready to expose any weak point that may be mentioned against this variety, believing the public should be correctly informed. We confess that we had fears that it was not hardy enough for us, and that we watched it anxiously, but from its appearance the past Winter and Spring we consider it as hardy as the Cuthbert. Red raspberries are becoming more profitable each season for market, and a valuable early variety is just what is needed. Just what position the Marlboro will take ultimately, we cannot state, but it promises exceedingly well. We advise all to endeavor to see it in fruit so as to be able to judge for themselves.

Voyages of Discovery.

We advise our readers to move about and see the new varieties in fruit this season. By this means you can judge of their value nearly as well as though you had been to the trouble and expense of testing them yourselves. We assure you that there is being made improvements in many fruits, more particularly the small fruits. If any one within a day's drive has the James Vick strawberry in bearing it will pay you to visit it. We sent out this believing it might become one of the most popular both for market and home use, and the more we see of it the stronger our hopes become, but



**THE NEW
HITE GRAPE**

NIAGARA.

This new purely native White Grape is a cross between Concord and Cassady. Hardy; as strong a grower as Concord; earlier and far better in quality. Bunches large and uniform; very compact, sometimes shouldered. Enormously productive; a four-year old vine producing 140 clusters, weighing from 8 to 16 ounces each. Selling in various markets at 15 to 25 cents per pound, when best California grapes brought ten cents. The most desirable white grape ever produced. **THE GRAPE FOR THE MILLION.**



time alone will tell. If it is the most profitable market berry you cannot learn the fact too soon. The first report from the James Vick this season comes from John T. Stark, Secretary of the West Tennessee Horticultural Society, Jackson, Tenn., dated May 1st, he says: "I picked my first James Vick this morning; a late frost injured the berries somewhat; this one measures one and one-fourth inches in length, and three and one-eighth inches in circumference, and I think there are fully two hundred berries on the plant this was picked from; color and shape beautiful. Hope to have some nice ones to exhibit at our meeting. When you get anything extra good please let me know." Get sight of the Atlantic, Mrs Garfield, Prince of Strawberries, Daniel Boone, Pipers' Seedling and other strawberries. When in fruit look up a plant of Hansell, Marlboro, Shaffer's Colossal, Montclair, Superb, Souhegan, Tyler and other raspberries, also Early Cluster, Wilson Jr., Stone's Hardy, Wallace, Taylor and other blackberries. It will pay you to see Fay's Currant, Lee's Prolific and the newer grapes, such as Moore's Early, Worden's, Pocklington, Prentiss, Duchess, Early Victor, Niagara, etc. If a man is breeding horses, cattle or sheep, he travels about to see what others are doing in his line. Fruit growers will fall behind if they do not do likewise. But do not visit other fruit growers in a critical mood, or with the conceit that your methods, your varieties, your plantations are superior. If they really are superior struggle hard not to show your host that you think so. There is no greater bore than the man who goes from one fruit farm to another without appearing to see anything worth seeing. Do not expect too much. Do not look for paved walks and sodded borders in the fields of fruit. Expect to discover plots apparently abandoned to weeds. Every propagator has such—they are the beds wherein his red raspberries and blackberries are permitted to sucker and produce young plants, and no cultivator dare enter. Be interested, be pleased, learn and be happy and wise.



Potted Strawberry Plants.

People often defer planting Strawberries in early spring, and desire later to start a bed. For such, plants grown in small pots are valuable, for they can be transplanted with a ball of earth about their roots at any time of the year, though if the weather is very hot and dry, water must be given them at intervals on the start. If planted

in hot, dry weather, fill the hole in which the plant is set (with the ball of earth left on undisturbed) with water, and so that the earth about the roots is thoroughly moistened. It is safer to shade the plants for a few days in such cases. But in ordinary moist soil, in coolish weather, potted plants will require no such attention.

In getting started with new varieties, potted plants are valuable. The drawback in planting in quantity is the weight of earth attached to the plants which makes express charges high. Potted plants are usually shipped in light baskets holding 100 plants or more, each. We planted potted Vicks in July, August and September of last year, and these plants will bear a crop this season, many having set 100 and more berries each, and they will be of large size.

In planting potted plants you gain by having to cultivate them for a shorter period, and the ground can be occupied with other crops early in the year, such as peas, or early potatoes, etc. But the extra expense of obtaining such plants will prevent their being planted on a large scale. Whatever you do, do not plant strawberries late in the fall from ordinary unpotted plants; they will not secure foothold by winter, and unless protected skillfully would be heaved out by frost and destroyed.

Bones, Ashes, Etc.

Three hundred pounds of unleached ashes mixed with 100 pounds of ground bones in a heap and kept moist would soon reduce the bone to a nearly soluble condition for a fertilizer. But as a caustic potash is a much more quickly active decomposing agent than the mild potash or carbonate, it would be better to add about a bushel of fresh-burned lime to the heap. When this slakes by the addition of water, it takes the carbonic acid from the potash in the ashes and makes it caustic, in which condition it will reduce the bone to a soluble condition very soon. the mixture should then be shoveled over and mixed with a fourth of its weight of plaster, which will prevent the escape of ammonia that will be produced. If the bone is raw, such a mixture will contain about four pounds of nitrogen, fifty pounds of phosphate of lime, and ten pounds of potash, worth at market price about \$4.50 per 100 pounds, not counting the lime and plaster, which will be additional. Ground bone can be bought for \$25 to \$30 a ton.—*N. Y. Times.*

It is held now that pear blight is not contagious, but by using a knife on healthy trees that has trimmed blighted ones, disease is thought to be carried. We desire to be careful what we assert regarding this business. Some people know all about pear blight and yellows, we do not.

A Catskill Fruit Grower.

"You have probably had some experience in fruit culture," I remarked to an aged and communicative Catskillian-on-the-Hudson. "Gosh, yes. When I was a boy Rochester nurserymen cum out here themselves and sold us trees. I bought fifty apple trees, dug big holes and filled em in with rich soils and sods. Beats all how they grew. Why men would cum to see them ar trees loaded down with apples, and think I was lyin when I told how few years they had been growin. Gosh, yes. And then my boys didn't like farming and I sold the old place, and the man who bought it let them trees take care of themselves. Well the grubs got inter em, the moss covered em, the branches looked dead like, and not an apple grew on em. Gosh, yes. And then I ses to that man, you dig out them ar dead trees and put in pear and plums, then tackle the earth with the hoe and cultivator, draw on some dung, white-wash em, lime em, train em. Well, he done it, and now he beats all of em with the biggest Bartlett pears and Lumbard plums you ever sot eyes on. Gosh, yes; and then I used to grow strawberries. Beats all how them things did turn out the berries, and big uns, you bet. You see I pulled off the runners and kept em in hills like and they did bear like mad, and I sold em all for 12 and 15 cents a quart. Ye see the nite boat takes em right to New York fresh as a clam, without a bruise or a jolt. Gosh, yes. But the boys don't like farmin. One of em is porter in the hotel, and one is train man on the railroad, and I help a little looking after fruit and pertaters for the hotel where my boy works. Farmin pays best. Gosh, yes! But what is an old feller to do when his boys don't like farmin, says I, and so I sells the farm and cums here and totes about like nobody. If them ere boys had stuck to the farm and the apples and berries, we'd had a heap of money now. Gosh, yes. For that new railroad (West Shore) has cum along, and you can't buy the old farm now for twice the money I got."

A Successful Weed.

If there is a more persistent weed than Mallows (cheese) I do not want to contend with it. When we took possession of our farm the yard was in a garden where the Mallows had seeded for many years. When formerly an old row of peach trees stood, with currants, burdocks and pigweeds between, we planted roses and other ornamentals, after cleaning it out thoroughly. The soil was rich and everything thrived. The Mallows came up as thick as hair on a horse. We fought it with hoe and cultivator, and have been fighting it for years since, but even now if

left uncultivated for a few weeks the Mallows reappear about as thick as ever, fresh seed being continually brought to the surface by cultivation. Where a plant of Mallows gets a good foothold in rich soil, it will cover a plot four feet across with root so strongly imbedded that the strongest man cannot pull it up. Very small plants go to seed, and all should be looked after closely in the fall. The roots are exceedingly tough, and the hoe and cultivator are often turned aside by them. A friend, on moving a barn, found a bed of decayed manure which he applied to his lawn, covering the sacred spot several inches deep. Soon he saw his fatal mistake, for mallows appeared thick and fast, and despite his efforts took possession, and he was never after able to conquer them. If our readers can tell how to get them out of a grass plot, or how to get them out of door yards where they have had full sway for half a century, we will gladly give the needed space. In enlarging fields in the nursery, we have occupied old lanes, where Mallows had gained foothold, with cherries and pears in nursery rows, where the soil received the most thorough culture, yet at this season we find the Mallows as thick in these spots as it is probable for them to grow. We are clearing them out, but will expect to see their faces again next season and the next until doomsday.

Hudson River Vineyards.

I probably passed within sight of nearly one hundred vineyards. Their important features, and the ideas suggested are as follows:

1. The importance of elevation. The higher the better. Here early and late frosts seldom do injury and the grapes become thoroughly ripe, a condition most devoutly to be sought. As Mr. Downing said when we called: "Don't send me any imperfectly ripened grapes to test, as they give no satisfaction."
2. Plant only on dry soil. There is much elevated land on the Hudson that slants so the water cannot run off. No vines will ever be planted here. The grape courts dry soil, dry seasons and warm dry countries; with an abundance of sunshine.
3. Thorough cultivation. The soil is kept loose and free from weeds by frequent cultivation with horse and hoe. Grass and weeds not only steal plant food and moisture; they shade the soil from the sun's rays and prevent early ripening of the fruit. The Acme is a good tool with which to work among vines.
4. Thinning the fruit. Overbearing causes the grapes to ripen very late if at all, and does permanent injury to the vines. How much each vine should bear depends on the vigor of the variety, its age and condition. The vines are not permitted to bear half what they would bear if undisturbed. By this thinning larger bunches are secured

and better prices in market, and often as many pounds as though twice as many bunches were left on.

5. Pruning close so as to avoid too many bunches setting, and keep the vines within bounds, and attentive tying to the wires. I never saw a successful vineyard when the vines were straggling away from the wires.

6. Fertility of soil. The mountain sides, after ages of washings of rains cannot be expected to be very rich. Here applications of manure give immediate results, and I find grape growers making every effort to increase the supply from the pig pens and stables.

7. The choice of varieties. Even on the Hudson river the old Concord is the most reliable. Though other varieties pay the best profits, many of them are expected occasionally to fail for one reason or another. It is safe to say that the Concord can be grown at half the expense of most of the other varieties, but many of the promising new varieties are not yet fully tested here.

8. Careful assorting and attractive packing for market, in packages with handles so that purchasers can carry them after purchasing, and so small as not to become wearisome to the purchaser. A dealer will sell many more fruits put up in five or ten pound baskets, than if offered in larger packages from which they must be unpacked and pawed over, many berries dropping off, and all made much less attractive. Not only grapes, but plums, peaches and rare apples and pears can profitably be marketed in this manner.

Manuring Fruit Trees.

It is singular how long some fallacies retain their hold, even after they have been disproved by facts, and of these, one of the most mischievous is the belief that fruit trees and bushes are liable to injury rather than benefit from the application of manure. All sorts of disease, such as canker and other ailments to which fruit trees are liable, are set down as the result of applying manure to the roots; whereas, in nine cases out of ten, it arises from poverty of the soil, causing the roots to run down into the bad subsoil. I am continually hearing complaints from owners of fruit trees as to their unsatisfactory condition, and on examination have invariably found scarcely any surface roots or fibres of any kind, nothing but large, thong-like roots, that run right down into the subsoil. On inquiry I have usually found that manuring or top-dressing had not been practiced for many years, their owners having come to the conclusion that such practices were dangerous.

I do not say that manure will prove to be a cure for fruit-tree ailments of all kinds, but I will briefly detail a few facts that have come under my observation at various times, to prove that starvation of the roots

is a far more prolific source of injury than abundant feeding of the surface roots, both with solid and liquid manures, and growers must form their own conclusions as to the best course to pursue. The fruitful or unfruitful state of orchard trees in nine cases out of ten, is entirely dependent on the attention which they receive as regards manuring.

In the fruit growing parts of Kent, where large orchards of standard trees planted on grass land is the rule, it is a well-established fact that if the grass is cut for hay and carried away, the trees soon become unfruitful and die out; while, on the contrary, if the grass is fed off, so that the nutriment is returned to the roots in the shape of manure, the trees keep fruitful and healthy. I have seen some of the most moss-grown, miserable specimens of starved orchard trees restored to fruitful condition by making the ground beneath them the winter quarters of sheep and pigs, feeding them at the same time as if they were in the farmyard with roots and corn.

The finest old specimens of apple and pear trees are generally those in an orchard next to the homestead that is used as a run for calves, sheep, pigs and poultry the whole year around. In these orchards the turf is short, and being full of nutriment the trees keep healthy and prolific for an indefinite period. Ashes, garden refuse, or any kind of road scrapings, or even scavengers' rubbish may be utilized for increasing our supply of orchard fruits. They should be spread roughly on the surface in winter, and in spring harrowed and rolled down firmly. The result will soon be a marked improvement in the size and quality of the crop. Difference of opinion prevails as to the pruning or non-pruning trees, some adopting one system and some another; but, be that as it may, I never knew fruit trees continue to yield good crops for any length of time unless the roots were supplied with manure in some form or other.—*London Garden.*

CULTIVATING STRAWBERRIES.—A writer in *Vick's Magazine* says that in raising strawberries for market, the rows should be at least twenty-five rods long, so that horse-power may be used in destroying every weed as soon as it sprouts, and the surface of the soil kept constantly clean and mellow. No ridges or furrows are to be formed between the rows.

OLD RASPBERRY CANES.—Mr. Hale recommends leaving the old canes which are past bearing, till the following Spring, to protect the new vines from wind and snow. Sometimes the snow thus accumulating has shielded the canes, and a better crop has been the result. Mr. R. Johnson, in his "Farm Notes" makes the same recommendation.

A Querist in a Fruit Garden.

How can I best fill out vacancies in raspberry and strawberry rows caused by plants dying from effects of drouth?

With strawberries permit the plants that survive to make new plants, and take up the new plants with a mass of earth about the roots in September, and plant where vacancies occur. Or, better, train the runners into quart baskets or small pots, and transplant from these when well rooted. With black raspberries, layer the young canes as soon as long enough, and transplant these young plants next Spring where vacancies occur, after the tips of young plants have grown an inch or two, leaving earth about the roots. With red raspberries fill vacancies now with green sucker plants that have sprung up about old plants on your place. Do not order green plants as they will not often endure shipment. Remove the leaves on planting.

Is it necessary to remove blossoms from newly set strawberries?

If set early, and the weather continues moist, the plants may come through in good condition, bearing fruit the first season. But if a drouth occurs after planting, the plants might perish from the drain upon their vitality in attempting to produce fruit before becoming established. I have known plantations to be saved in such cases by removing every blossom and green berry.

What is the best plan for carrying plants through a drouth?

I never water them. As ordinarily done, watering is detrimental. I mulch each plant with muck or sawdust, or in the field with loose fine earth. Even where the soil in the row has become hard this mulch of fine earth often saves the plants through a long drouth, if the spaces between the rows are cultivated frequently.

When is the best time to head black raspberries and blackberries?

If you wish to grow without stakes (the approved method) pinch off the tips of young canes as soon as they get about two feet high. If you wait until the canes are four or five feet high and then cut off a foot or more, you check growth and lose some of the best buds. I cut back the bearing canes of red raspberries, and shortening in side branches early in the Spring, securing more and better fruit than if the entire canes were left on and giving better opportunity for the pickers to move about without breaking off the ripe berries.

Is Summer pruning of the grape advisable?

Grape growers thin grapes by pulling off surplus buds and shoots and shortening in canes, allowing but three or four bunches to each cane, when the trellis is well covered. If left to itself the grapevine sets twice as many clusters as it can bring to perfection. If a large part of the clusters are removed early, those remaining will be

much larger, will ripen earlier and be of better quality and the vitality of the vine be perpetuated.

How long is it profitable to allow strawberries, raspberries, etc., to grow on the same soil without renewing?

Some varieties run out much sooner than others. Ordinarily three years with strawberries, five with blackberries and currants is the extent, though many are profitable much longer, and strawberries might continue an existence for a lifetime. The better the culture, and the richer and better drained the soil, the longer the plant endures. Where land is very high-priced strawberries are only allowed to remain long enough to produce one crop. Where land is cheaper there is no limit to the ingenuity that may be applied to keeping the beds renewed and productive year after year, keeping in view the fact that the young plants possess the most vigor.

Are large fruits as profitable as small fruits?

As a rule they are not. Our small fruits seldom fail to give a crop, while the pears, apples, peaches and plums often have their barren years. But the trees require less attention than plants and vines, and we do not feel the loss of a crop so seriously from them. While engaged in the business one should desire to grow the large fruits as well as the small.

Does fancy fruit growing pay?

No. If growing fruit as a business you must learn the cheapest method of producing it. It pays to fertilize well, to give good culture, to offer in attractive style in market, and to raise the best varieties, but there is a limit to high culture, and to everything connected with the business. Every man must be his own judge as to when he has reached this limit. Some men can grow fruit at half the cost of others. Some men can manufacture shoes for less than others. Good common sense carries a man a long way toward success in this country. —[Charles A. Green in N. Y. Tribune.

A French method for converting cider into vinegar is as follows: Scald three barrels or casks with hot water, rinse thoroughly and empty. Then scald with vinegar, rolling the barrels and allowing them to stand on their sides two or three days, until they become thoroughly saturated with vinegar. The barrels are then filled about one-third with strong pure cider vinegar and two gallons of cider acid added. Every eight days thereafter two gallons of cider are added until the barrels are two-thirds full. The whole is allowed to stand fourteen days longer, when it will be found to be good vinegar, and one-half of it may be drawn and the process of filling up with cider began again. In summer the barrels are allowed to stand in the sun, and in cold weather kept where the temperature is 80 degrees.



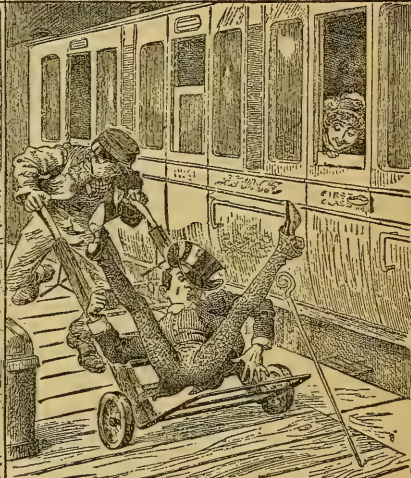
"Wonder whether nice girls going down by train."



"Doddid nice girls! Stroll past don't ye know?"



"Rather fetched him, flatter myself, dear boy."



"What the —?"

A Sleepy Hollow Romance, Illustrated.

Timothy Baldwin visits the metropolis to make arrangements with his commission house to sell the fruit from his great farm at Sleepy Hollow, in Western New York. He takes his pretty daughter along to show her the sights. Now Timothy is rich. The grapes from the hillsides, the berries from the valleys, the red-cheeked apples, the golden pears, the delicious peaches had year by year added to his bank account, until he need have no fear of keeping the wolf from his door. His daughter, Betsy, had been given the best advantages, and had recently graduated with honors. He

was proud of her, yet not pleased with the admiring glances bestowed upon her by his fellow passengers, several of whom found no favor though they attempted to enter into conversation with Timothy, appearing deeply interested in fruit culture and other rural affairs. The journey progressed as all journeys do. The newsagent dumped Bob Ingersoll's and the Bad Boy's book into their laps, the cough lozenges, and prize candies. The brakeman entered anon to bawl out the unintelligible names of stations, the conductor moved to and fro like a brigadier. By the way where are the peanuts that used to be offered so freely on the cars in days of old? They are banished and the mild-flavored and less dyspeptic oranges, figs and banana are substituted.

From Albany Timothy took the day-boat desiring to enjoy again the beautiful Hudson river scenery, and to point out its attractions to Betsy. A band of musicians was aboard, the deck was well-filled with pleasure seekers, the grand old hills loomed up sublimely, and Timothy and Betsy were happy. They stopped at the Astor House in New York, and will never forget the delicacies for which the place is famous. After attending to business and showing Betsy Brooklyn Bridge, Prospect and Central Parks, the sights on Broadway, the art galleries, and the museums, our friends got aboard the cars at the Grand Central depot for home, Betsy taking the seat next the window, through the frame of which her sweet face beamed bewitchingly. At this point a foppishly dressed young man appears, and is at once smitten by Betsy. He attempts to attract her attention by strutting up and down the platform. Timothy meanwhile is figuring up his prospective profits from fruit. Last year he sold his red raspberries for \$4,000, his strawberries for \$2,000, his black caps and blackberries for \$2,000 more. He explains to Betsy that he figures the sum higher this year than ever before, when she exclaims: "Father do see this funny little man." Now Timothy is mild mannered generally but when he saw this foppish nincompoop smirking and flirting he was as mad as though he had recently sat down on a red hot hornets nest. He said nothing, but unobserved by the fop, watched his antics. Suddenly Timothy darts out of the rear end of the train. There lies the two wheeled truck used for moving baggage. He sees the dandy strutting in the opposite direction near the window where Betsy sits, unconscious of impending disaster. Suddenly Timothy remembers that his trunks are not yet aboard, for he dashes towards the young man in fine attire with the speed of a fast mail train, and the catastrophe depicted in our last illustration transpires. Berries still flourish in Sleepy Hollow, where Timothy lives, and the gossips tell of Betsy's approaching wedding. She is to marry one of the foremost farmers. Probably some of her purchases on Broadway will be worn on her wedding day. Illustrations from *Rural New-Yorker*—romance by our editor.

A plan for a cold fruit house is given elsewhere in this issue. It would seem to be unnecessary to go to such great expense. Such houses are now built with simply room between outside and inside sheathing, to admit of one foot of space for sawdust—the theory being to confine cold air. It is remarkable that any section of country where fruits are grown should be without some such building for storing fruit in its fresh state. Simply an ordinary ice house is a safe place to keep a few crates of berries or other fruits.

A neighbor sowed oats among his currants, and the currant worm, previously destructive, did not appear. Where they are troublesome give them powdered hellebore promptly, at first sight, sprinkled on when bushes are wet with dew.

The *Science Monthly* reports the cause of the cathartic energy of pears. Ripe Bartlett's are found to contain sharp pointed crystals which irritate the walls of the intestines. The Keiffer Pear has this clear grit, which will enable it to push its way to popularity.

Drake's Traveler's Magazine says that the "nursery trade of Rochester is not surpassed by that of any other place in the world. The suburbs are highly cultivated, having 4,000 acres of fruit trees and numerous nurseries, each of which comprise from 250 to 500 acres."

"An honest strawberry box is the noblest work of man." This cruel thrust at the man who invented the box with the bottom half way to the top, will bring tears to the eyes of the sympathetic. How much better strawberries taste when there are few of them, and the price high. And then Barnum says the world likes humbugs. Certainly this box looks as innocent as a new born babe, at first glance, and liberal too in proportions. But so long as imperfection prevails in the human race, just so long will complaints be made when it is difficult to tell which end of the box holds most, the bottom or top.

Stone wall fences are an abomination. They must go with the crooked rail fences, as barbed wire becomes better known. It is about impossible to climb over a stone wall without loosening the stones, thus a wall where hunters or children often pass, soon tumbles down, and what an elephant on your hands it is to repair. Nothing looks worse than a broken down stone wall. Fasten one barbed wire over your walls in place of rails and people will not attempt to climb it. Barbed wire makes the cheapest fence. Winds have no effect on it. Unruly cattle and horses respect it. If we had it twenty years ago there would now be no unruly or jumping stock.

TO ESCAPE LIGHTNING.—Carry as little metal as possible about your person. When the storm approaches shelter yourself in the nearest brick or stone building. If none be near you, stand still or lie down on your face, regardless of the rain, which is really a protection. Avoid the shelter of trees and doorways, also out-houses, such as barns or stables, whether of stone or wood, especially of the latter. I consider that open, low, dry, stony ground is safer than high, wet and grassy ground, and that leeward sites are safer than windward ones. On seeking shelter laborers should leave their tools behind, as the metal is apt to attract the electric fluid.



THIS INTRODUCES OUR PORTFOLIO.

Planting the Apple Tree.

Come, let us plant the apple-tree !
 Cleave the tough greensward with the spade ;
 Wide let it hollow bed be made,
 There gently lay the roots, and there
 Sift the dark mould with kindly care,
 And press it o'er them tenderly ;
 As, round the sleeping infant's feet,
 We softly fold the cradle-sheet,
 So plant we the apple-tree.

What plant we in the apple-tree ?
 Buds, which the breath of summer days
 Shall lengthen into leafy sprays ;
 Boughs, which the thrush with crimson breast,
 Shall haunt, and sing, and hide her nest.
 We plant upon the sunny lea
 A shadow for the noontide hour,
 A shelter from the summer shower,
 When we plant the apple-tree.

What plant we in the apple tree ?
 Sweet for a hundred flowery springs,
 To load the May wind's restless wings ;
 When from the orchard-row, he pours
 Its fragrance through our open doors,
 A world of blossoms for the bee—
 Flowers for the sick girl's silent room.
 For the glad infant sprigs of bloom,
 We plant with the apple-tree.

What plant we with the apple-tree ?
 Fruits that shall swell in sunny June.
 And redden in the August noon,
 And drop as gentle airs come by
 That fan the blue September sky ;
 While children, wild with noisy glee,
 Shall scent their fragrance as they pass,
 And search for them the tufted grass
 At the foot of the apple-tree.—*Bryant.*

PRIMER OF HORTICULTURE.

PREPARED BY CHARLES W. GARFIELD.

The Peach.

The peach is one of the most delicious fruits grown in a temperate climate, and whenever it succeeds its cultivation yields a larger net return than perhaps any other fruit—every succeeding year affords evidence that it may be successfully grown in many localities where heretofore it was supposed such an undertaking would result in failure.

Being a native of a warmer climate than ours, it is often injured by the intense cold of Winter. It is therefore advisable to fortify the tree in every possible way against the rigors of our northern climate. This precaution is the first step toward success, and in many localities is imperative.

Several factors will enter into the account in securing this result. First—the site for the orchard should be elevated above the lands adjacent, and the surface should incline considerably in order to secure perfect drainage for excess of water and cold air. The cold air being heavier than warm air will run off, if the surface is descending, and will occupy the lowest level the same as water; for this reason, among others, peaches will not succeed on low ground, nor even on high land if the surface is a dead level for some distance around.

For the same reasons, all depressions having no outlet should be avoided. Neither will a peach orchard succeed on heavy clay soil when the subsoil retains an excess of water, unless very thoroughly underdrained and the subsoil broken up. If it becomes again apparently compact, the roots will be enabled to penetrate such soil far more readily than they could before it was broken up.

It is known that the roots of the peach tree have less power to penetrate the hard earth than those of many other fruit trees, and require a loose, friable soil and subsoil. Such a condition of the soil allows the water to pass off readily and admits light and heat, both important agents in vegetable growth.

The best soil for the peach is a deep, strong, gravelly loam or a heavy loam with a porous subsoil. Sandy land is preferable to heavy clays, and with the use of fertilizers will produce fruit of excellent quality and in reasonable abundance.

As an incentive to a thorough preparation of the earth before planting out the orchard and of the most prompt and thorough cultivation afterward, we may say that an acre of land adapted to and thoroughly prepared for growing peaches, will produce a net income equal to three or four acres devoted to farm crops, and on sandy land the peach orchard will show a still larger balance in its favor.

Farmers too often seem satisfied with shallow cultivation, and their crops usually correspond with the labor and skill used in conducting their farm operations. Now, while the ordinary returns from farming may not warrant the expense of fertilizing, underdraining, and subsoiling, to the extent I have indicated, the case is far different in laying a sure foundation for a profitable peach orchard.

The usual depth of plowing is six inches—the subsoil below that distance is of little benefit to growing crops unless the roots can penetrate through it. If the bed of mellow earth can be made one foot deep instead of six inches, the productive capacity of the orchard will be increased in the same ratio.

The benefits secured by a thorough breaking up of the soil to a proper depth may be stated as follows: Air, light and heat, indispensable agents in growing fruit and all farm crops, are more freely admitted to the whole depth of soil to work out these wonderful changes which produce such abundant and beautiful crops of fruit and grain. The air brings with it elements of fertility, heat from the sun's rays and is laden with moisture. It yields up a portion of its heat as it penetrates the cool earth; this cooling process lessens its capacity to hold moisture and a portion of this is also given up to the earth. This will explain why a deep, mellow soil will carry a crop of fruit through a severe drought so much better than a shallow one. A deep, mellow bed of earth will also retain a greater amount of rain water without displacing other agencies required to carry on vegetable growth.

During very dry weather the fruits growing on the shallow soils are pinched and shriveled and often become entirely worthless, while a deep soil yields up the moisture it has held in store to the multitude of roots which fill the ground. The fruit swells, and grows in size and beauty, and gladdens the heart of the owner in the prospect of an abundant harvest. While the one must offer a small measure of lean, inferior fruit, the other is blessed with an abundant yield of beautiful fruit which is in demand at the highest prices.

It is very true that in many sections the growing of peaches has proved a very profitable business, where the orchards have been set out on land prepared as for ordinary farm crops, and the orchard has received only the most primitive cultivation; but there is no doubt that these same orchards would have nearly doubled their yield of fruit had they received generous care and cultivation.

In selecting a location for an orchard it is well to keep in mind that the nearer the soil meets these requirements in its natural state the less expense will be required in its preparation.

The cost of drawing a large crop of peaches to market is an important item. If near a good market or shipping point, the fruit can be more expeditiously handled and disposed of at just the right time and in the best possible condition, which means your net proceeds will be fifty to one hundred per cent. more than if the fruit were carted a long distance and reached its destination twenty-four hours late.

Peaches, being perishable and delicate fruit, it is important that they be handled with the greatest care and reach a market in the least possible time, in order to bring the best price.

It is difficult for a beginner to select suitable varieties from the long list of names found in the nurseryman's catalogue. Many varieties adapted for home use or for the amateur, would be unfit to grow for market purposes. Some varieties are very tender and perishable; others ripen during the hottest part of Summer, and are liable to rot on the tree or decay in transportation. At this season a warm rain of one or more days' duration will often cause a loss of the entire crop, unless one is favored with a home market, or with facilities for drying the fruit.

Peaches ripening so early in the season are not the best for drying, nor for canning.

Select varieties for planting an orchard that will bear abundant annual crops of fruit; that will endure transportation; that are of good size and of handsome appearance (a great deal depends on pleasing the eye).

Varieties should be planted to ripen in succession, so as to give more time for gathering and marketing. A good proportion of the fruit should, for many reasons, ripen during the latter part of the season.

Remember and plant only a few sorts, and those of the best. Set every kind by itself, for when you come to harvest the peaches it will be much more convenient.

Trim the trees to a whip on planting. Keep the soil in some cultivated crop continually. J. D. HUSTED.

THE RAISING OF PEARS.

I am asked to tell how I raise pears. Well, it is not a difficult matter. Simply go at it with good common sense and careful watching of your trees and most any one can grow them. As to location of the orchard, if I could have just what I wanted, it should be on a gentle slope toward the south, and the soil a gravelly loam on clay sub-soil or, next best, an entirely clay soil. If the latter, or if the clay in the first case was near the surface, it would probably be necessary to under-drain the land. I consider a southern slope, where the trees get the full sun, better than a northern exposure, and I would as soon have it exposed to winds as sheltered. My preparation for planting would be to grow corn well matured, on the ground the previous year and in the Spring just before setting out the orchard, plow the land well. Then where I wanted the trees to stand, which I would have not more than one rod apart each way, I would dig holes three feet across and eighteen inches deep and loosen up the sub-soil for another spade's depth, scatter about one quart of salt over this loosened sub-soil in each hole and then fill in six inches of good, top earth, leaving the hole about one foot deep. Here I would set the trees, carefully preserving and laying out every fibrous root and packing the earth well around the roots.

As to selection of the trees: They should be two years old from the graft, and both tops and roots (especially the latter) well grown and first-class in every particular. In buying trees from a dealer or agent I make them strike out that clause about furnishing other varieties equally good if they happen to be out of what I order. After setting the trees I leave the surface close around the tree a little dishing or hollowed the first year, so as to enable it to get all the moisture it needs. I never mulch but very little, while I hoe about the trees so as to keep the surface mellow.

My after cultivation is to grow some hoed crop among the trees for five years, cultivating the ground well, but not manuring too heavily. I think the ground can be too rich for the pear.

The selection of varieties for my orchard, whether for my own use or for market, would be Bartlett, for early; Seckel and Sheldon, Autumn; and Duchess d'Angouleme, late Autumn. The last I regard as one of the best. For sake of variety I also have Onondaga, Lawrence, Buerre d'Anjou, Louise Bonne de Jersey, and others.

My practice in ripening and marketing is to pick when matured, though still green in color and somewhat hard (when they pick easily by lifting them up, is the test). Put in barrels in the dark, when they will "sweat," and the pears as well as the barrel inside will be covered with drops of water. Afterwards they will turn yellow, and are then ready to sell or can. If I shipped away, of course I would have to send them green. DONEY.

Orchard Culture of Plums.

There are three serious obstacles in the way of plum growing, viz: Premature shedding of leaf, curculio and rot.

While inferior crops of apples or peaches may be grown on land seeded to grass or grain, plums are generally a total failure, under such treatment. With such usage they frequently shed their leaves in midsummer, when all growth of tree and fruit ceases. Thorough cultivation until the crop is nearly matured is the best known remedy for this evil.

When successful, the plum bears immense crops, for which reason annual manuring is absolutely necessary to supply the ingredients taken away with the crops. A failure in this respect generally means a failure of crop.

The attempt to raise plums without heavy manuring and thorough cultivation is useless. One or two crops may be obtained, after which the trees usually make a feeble growth, and perish during the first hard Winter. If the curculio withheld his friendly aid, this inclination to overbear would sweep the larger portion of plum orchards out of existence; and while we gratefully acknowledge the kindness of the "Little Turk" in assisting us to prolong the lives of our plum orchards, we regret that he is seriously inclined to overdo the thing—"take the lion's share," and compel us to "declare war," and act upon the defensive; that mode of warfare known as the "jarring process," which consists in jarring down the insects upon a cloth spread out for that purpose, will lead to certain victory if diligently prosecuted. The cost of such warfare need not exceed ten cents per tree. Promptness in action is essential to success; a few days' delay and the crop might be lost. The time to commence operations is easily determined by examining the plums daily, as soon as they burst the remains of the calyx enclosing them; if the "crescent sign" is to be found on the fruit, commence operations, although some plum growers allow the insect to puncture one-half the crop before beginning, as they believe it to be a cheaper method of thinning than by hand. All fruit falling on account of being punctured by the curculio, should be picked up at least once per week, and destroyed. I think the young curculio usually remains in the plum about ten days after it falls. To jar small trees a nail may be driven in the tree, which I believe does no injury; or a limb may be sawed off an inch or so from the trunk, and struck with a hammer. When the trees become large I have found a crotched stick, five or six feet long, about as heavy as a common handspike, with the crotch wound with a cloth to prevent bruising the most convenient to jar the trees. The tree should be approached as quietly as possible, and let the jar be sudden. Shaking the tree will not answer. Sometimes in the middle of the day, especially if it be warm the curculio will fly off the sheet before they can be caught; sprinkling the sheet with water will prevent that. I believe if each tree be shaken every hour in the day while they are at work, all, or nearly all will be caught, although they might come from adjacent orchards afterwards and destroy the crop. The idea that early morning is the only time they can be successfully caught is a fallacy. I have known heavy crops secured, where curculio swarmed by the thousands, while the jarring was only continued one or two days. Each tree was jarred repeatedly during the day and the jarring was continued until none could be caught.

If from any cause they should be allowed to puncture the entire crop, don't conclude that the crop is lost, for if chilly weather follows immediately after they have done their work, very few if any, will hatch, and no harm is done, as the small wound they make soon heals up. I have known them deposit their eggs several times before any hatched.

For rot I know of no certain remedy. Hundreds, yea thousands of bushels of plums have rotted in northern Michigan in the last few years. The idea that they rot only where they hang on the tree so as to touch each other is incorrect; I have known them thinned so that they did not come in contact, yet they all rotted; picking the fruit as soon as the rot appears on it does not appear to do any good.

Last October I read an article in the New York *Witness*, I am sorry I have it not at hand, which stated that if the fruit was picked carefully as soon as it commenced to rot and then placed in a pail of water to prevent the spores of the decayed fruit from rising and lighting on the fruit remaining upon the tree, carried away and burned or deeply buried in the ground, tree and fruit be liberally sprinkled with lime, that it would prove a certain remedy for rot. It also stated that the spores contained in the decayed fruit, if left under the tree, would cause the fruit to rot the next season. I have noticed that when the fruit rotted once on a tree it continued to rot year after year. If the above should prove to be a certain remedy for rot, then I know no reason why plum growing may not be made a success; if not, then the rot is a serious obstacle, although I have never known it to appear until after several crops were raised.

Plums succeed in any soil where apples or peaches would, although heavy soils are preferable. Almost all the varieties of plums succeed on the peach stock, the only exceptions I know of being the Lombard and

the Canada Egg; the former grows well on the peach, but fails to unite properly, and is therefore liable to blow off, and the latter seldom grows at all. There are thousands of plum trees in this vicinity on peach stocks which have been set ten or fifteen years, and have done equally as well if not better, than those on plum stocks. For light soils I certainly prefer the plum on peach, if not for all soils.

Fifteen feet apart each way is the proper distance for the trees to be set.

In reference to varieties the following are excellent and perhaps as good as any: Bradshaw, Prince Englebert, Purple Egg, Pond's seedling, Lombard and Coe's Golden Drop. The above are named in their order of ripening. The first four are large, beautiful plums commanding the highest price in market. The Lombard is vigorous and exceedingly productive, but fails in some localities; it bears very young. Coe's Golden Drop bears immense crops every other year. The Purple Egg is the most vigorous growing tree with which I am acquainted, carrying its foliage through seasons when all others have failed; it is exceedingly hardy. The Bradshaw is slightly tender. With my present knowledge of plums I think one would not go far astray by setting an equal number of the above varieties, although I may think very differently in the future.

G. C. McCATCHIE.

A GRAPE GROWER'S ADVICE

In abridged form for these pages and the counsel is certainly clearly defined and practical. Here it is:

There is nothing subtle or mysterious in planting grape roots or young trees of any kind, any more than there is in planting potatoes or cabbage.

1. The ground should be prepared one year in advance by raising on it a crop of corn or potatoes, or by Summer fallow; but were I prepared to plant, I would not defer planting; plant at any rate, and cultivate as you would corn or any other small crop, and you will be surprised to see the rapid growth your vines will make.

2. High rolling land, of a gravelly nature, is in my opinion best adapted to successful grape culture. The grape needs heat and sunshine, the former to ripen the fruit, and the latter to prevent mildew.

3. Were I to plant a vineyard again I would plant the roots eight feet apart each way in perfect rows. There are those who advise eight by ten, and ten by twelve, but I hold that eight by eight affords room enough for all practical purposes. Mark each way with a plow and plant at the crossing of the furrows, and but an inch or two deeper; straighten the roots out and cover them up with a hoe, leaving the eye even with the surface, and the work is done. Corn, potatoes, beans or other vegetables may be raised on the same ground between the grape plants during the first two seasons without any injury to the vines.

4. As young vines throw up several shoots during the first two or three Summers after planting, care should be taken to remove them, also to cut off all branches but the leading one to a height of sixteen or twenty inches. The first year the vines may trail on the ground, but the second season they should by all means be tied up to a stake. I have no opinion to offer respecting the two leading systems of grape culture, stake or trellis, as both have warm advocates. The stake system appears to be the cheapest in cultivation, because the cultivator can work both ways; while under the trellis plan the work can be performed only one way. The planter must then choose between the two.

5. Pruning may be done at any time between the fall of the leaf and the 20th of March, cutting back to two or three eyes on the young timber.

6. As to varieties, the Concord holds first place on the lake shore, and I believe also, in the general market; and for all purposes it appears to be the most profitable grape yet introduced. We have several new kinds of a greenish white color that are highly spoken of, known as the Prentiss, Pocklington and Niagara.

JOSEPH LANIN.

The Quince.

The more common mode of propagation is by layers or cuttings; but commercial propagators frequently plant stools in very rich soil, cutting them back to very near the ground, and encouraging the growth of numerous shoots the first year. The next year rich earth is filled in a few inches deep among and about the clump of young shoots, which during the next Summer

become well rooted plants, and are, in Autumn or the following Spring, cut away from the parent plant, and may be at once planted in orchard, or grown a year in nursery rows to acquire a larger size.

This fruit grows naturally in rather moist (not wet) soils; often along streams of water. Although it is frequently planted with some success in light soils, it will, however, be found most satisfactory in a moist, strong, clay loam. In such a soil we have found it, under good cultivation, with the soil well manured, enormously productive. Under neglect and starvation the trees soon become stunted and unproductive; when they are very liable to be attacked by the flat headed apple tree borer, generally with fatal effect.

About ten feet apart each way is a sufficient distance for the largest trees we have ever seen in this State. The tree has a tendency to produce suckers from its base. These should be persistently removed and the tree grown with a single trunk, from one to one and a half feet high, with little pruning, beyond the removal of crossing branches.

The borers are less likely to attack vigorous trees. For this reason it is specially important that they be not permitted to suffer a check in growth. Even this, however, in the case of the quince should not be relied on, but in May or early June, and perhaps again later in the season, the trunks should be well washed with lye or strong soap suds to repel their attacks and destroy the eggs if already deposited.

As already remarked, the soil should be kept rich; and thorough cultivation should be kept up till about the middle of August, when it should cease for the season, that the young growth may become well ripened, before the advent of severe weather. After the roots have taken possession of the soil between the rows, cultivation should be shallow, and it will be found preferable to plow toward the rows, so that a considerable hillock shall be maintained about the tree, thus keeping the roots well protected against winter exposure.

This must depend greatly upon the exposure and the nature of the soil. In a bleak situation, or on ground liable to standing water, at any season, we would not plant till Spring. If sheltered from the coldest winds and with sufficient drainage, early Autumn will be preferable, as the roots will be prepared for an earlier start in Spring.

VARIETIES.

The Apple or Orange Quince is the only variety that can yet be recommended for general market planting, and is, in fact, the only one offered in our markets.

Rea's Mammoth is a comparatively new variety, said to be much larger than the preceding and otherwise very much like it; but its value as a market variety is yet undetermined. The plant is vigorous and healthy.

Champion is a yet more recent sort, which is said to be of larger size than the Apple. Our experience with it indicates that it may be later in ripening and little, if any, larger. The plant is less vigorous and a much earlier bearer.

It is not the top but the root of quince trees that is tender. Of course, the top wholly or partially dies according to the amount of injury to the root, not to the top.

We can see this by noting the greater degrees of injury in high, dry, cultivated soil, than in low, moist places, where the ground is covered by snow or where a grass turf affords protection to the roots. Under a neglectful system, where no proper means are provided for covering the roots in winter, this fruit will do better than any other to be left in grass. It is not the best management even for the quince, but grass will at least prevent that deep freezing of the soil so sure to follow where no protection is provided. All over the country the most successful quince trees are grown in clumps where the trees protect themselves, or in corners of fences where annual deposits of falling leaves afford protection to the roots.

Mulching quince trees in Winter and heavy manuring in Summer are the chief secrets of success with this shy fruit. The top is nearly or quite as hardy as the apple, and if the root is properly protected and the soil enriched, quinces can be grown in most localities where apples succeed.

Salt has been recommended as a specific manure for the quince. It is undoubtedly helpful, but it owes its good effect more to its influence in keeping the soil moist and preventing its deep freezing, than to any inherent manurial properties. There are undoubtedly times when salt is absolutely hurtful to quince trees, applied in large quantities after deep cultivation, which has broken, torn, and bruised the tender roots. Of the

mineral manures, potash, in the form of wood ashes, leached or unleached, we have found most beneficial.
T. T. LYON.

Currants and Gooseberries.

We doubt if there are at the present time any small fruits more profitable for the family or market than currants or gooseberries, if the right soil and varieties are selected for planting.

The old Red Dutch, White Grape, and Victoria will do fairly well on dry soils, although currants and gooseberries of all kinds give best returns planted on rich, moist soils. It is useless to plant Cherry or La Versailles on light, sandy soil. But from years of experience with the above fruits I do not hesitate to say if the planter has soil that will produce a full crop of corn or wheat, and will plant the following varieties, and give good cultivation, he will be pretty sure to have a remunerative crop every year:

For currants, Red Dutch, Victoria, and White Grape; gooseberries, Downing and Smith's Improved. The old Houghton is too small and dark to sell well in the market. The Downing and Smith's are just as prolific, hardy, and free from mildew.

The Victoria currant holds its foliage much better than any other variety we have ever planted, making it very valuable in seasons when other varieties drop the foliage before fully ripening the fruit, and in consequence the fruit becomes sun-scalded.

The currant may be readily propagated by making cuttings, say ten inches long, and planting in the Fall; they should be planted down nearly the entire length, and a mulching of coarse manure spread over them to prevent heaving, through the winter. Cuttings put in, in this manner, will nearly every one grow.

Gooseberries are best propagated by layers. If the young wood is layered in July just after the fruit is picked, it will be sufficiently rooted to plant out the next Spring. Currants and gooseberries should be closely watched for the currant worm, which first appears in the middle of the bush. If attended to in time it can quite easily be kept off with white hellebore. We use a tin sprinkler made for potato vines. Open the bushes, put the sprinkler down in and thoroughly dust the middle of the bush.

Currants and gooseberries like all other fruits should be kept well pruned and thinned out.

J. N. STEARNS.

Raspberries.

A rich, deep, well-drained loam, is undoubtedly the best soil for the raspberry. It is sooner injured by excessive moisture than almost any other cultivated fruit, and, in planting, an elevated location should, if possible, always be selected. In planting black caps of strong growth like Gregg, the rows should be at least seven feet apart, with plants three feet apart in the row. Between the rows Irish potatoes may be profitably planted the first season. Red varieties of the Antwerp type should be planted five feet apart, with plants two feet from each other in the row. Fall planting is recommended by a majority of growers, but my experience causes me to believe that the tips of black caps can be most successfully transplanted in early Spring. Mellow earth should be placed on the plants to allow the young shoots to reach the surface without difficulty. If properly pruned, the raspberry needs no artificial support. Plants of red or black varieties should, when two feet high, have the terminal bud nipped for the purpose of forcing a lateral growth, and thereby increasing the productiveness of the plant. Such shoots generally grow in a circle, and balance the plant when weighted with fruit. As all shoots do not begin to grow at the same time, repeated nippings, during the growing season, will be found necessary. Black caps are propagated from tips of the branches that should be covered with earth early in September to enable them to take root. About the end of October they should be taken up and "heeled in" on high ground, or allowed to remain where grown until Spring, if not liable to be lifted by frost. All varieties that produce suckers may be propagated from root-cuttings, treated in precisely the same manner as root-cuttings of the blackberry. All dead wood should be removed as soon as convenient after fruiting terminates. This advice also applies to the blackberry, and is prompted by the belief that a dead branch largely taxes the vitality of living roots. Red raspberries are not as firm as black caps, and on that account are almost invariably sent to market in quart or pint boxes. The two-bushel stand, containing four drawers holding half a bushel each, is generally

used in shipping black caps. Tyler and Souhegan are probably the best extra early black caps now cultivated. Tyler, on account of its superiority to Doolittle, is rapidly taking the place of that variety in the great raspberry plantations of New York; and Souhegan, a more recent introduction, is warmly commended by all who have tested it. Gregg is the best very late black cap ever cultivated, and whoever will produce a better variety may well be proud of the achievement. Of well-tested red varieties, Turner is the best extra early sort. It is very productive, of the most delicious flavor, and perfectly hardy. Cuthbert has no equal as a very late red variety. It is even later than Gregg. Very productive, hardy, and a strong grower. Fruit large, sweet, and very attractive in color.

Second,

Blackberries.

A clay soil, naturally or artificially well drained, is most favorable to the blackberry. On such a soil its wood will often pass in good condition through frosts which would destroy the same variety in low, undrained ground. My observations in my own patches last Spring fully satisfied me of this fact. As the soil best calculated to produce hardy, well-matured wood is often thin, it should be enriched and deeply ploughed before planting, to enable young plants to make a rapid growth, and produce a crop as soon as possible. But for the production of large and luscious fruit, and to prevent the injurious effects of drought, annual top dressings between plants in the rows, of manure, leaves, or straw, should be given in sufficient quantity to smother grass and weeds. In planting, the rows should be seven and one-half or eight feet apart, with plants two feet apart in the row. If properly cultivated and pruned such rows at the end of the third year from planting should resemble a well-kept hedge and barely allow a horse and plough to pass between without touching. I have often substituted root cuttings for plants when the latter were scarce, and have found them to grow with much certainty if kept in a cellar or buried beyond the reach of frost in well-drained ground during the Winter and planted early in Spring. Such root cuttings should each be two and one-half or three inches long. A plantation from root cuttings would, of course, require one season more than thrifty plants to produce a fair crop. The blackberry does not produce a paying crop until it has been planted two or three years. To economize in time and labor it has always been my practice, when planting blackberries, to plant strawberries in the same row with them, and a row of strawberries midway between blackberry rows. My strawberries, thus grown, have in every way been equal to those grown alone in other patches, and have continued to yield good crops until finally smothered by blackberry plants. A mixed patch of this kind of an acre in extent, planted four years, this year produced a fair crop of strawberries, and more than an ordinary one of blackberries; and both varieties now give promise of a good crop next season. Sufficient cultivation between rows should be given to repress weeds and grass, but the ground should not be stirred after the first of September, as it might induce a growth of immature wood unable to withstand severe frosts. All blackberry plants should have their terminal buds nipped when three feet high, to force them to throw out lateral shoots. The more wood the more fruit, and by thus nipping the amount of wood is at least trebled; and as all canes do not shoot at the same time, repeated nippings, generally two or three, will be found necessary during the growing season. A pair of flexible sheep shears is the best implement imaginable for such work. Blackberries should be allowed to remain on the bushes until sweet and ripe, and should not be picked oftener than twice a week if intended for a home market. When picked the berries should never be exposed to a burning sun, as such exposure changes their color from black to red and gives them a bitter flavor. Blackberries are best shipped in two-bushel stands. For a home market the Hallock quart box in a sixteen or twenty-four quart crate is perfectly satisfactory.

I have tested almost every prominent blackberry, and have found but three varieties hardy and profitable in central Indiana. They are Snyder, Wallace, and Taylor's Prolific. I have cultivated them for several years, and each successive crop has increased my good opinion of them. They are all wonderfully productive, vigorous, free from disease, and of the most delicious flavor. Snyder ripens first, berry of medium

size, of a brilliant black color, and very attractive in appearance; Wallace is medium in ripening, berries large, plants on old roots more vigorous and stately than those of any other variety, young plants inclined to droop; Taylor's prolific is as late as Lawton in ripening, and is probably the most delicious blackberry now cultivated, berries rather above medium size and produced in immense clusters, young plants inclined to droop, but strong and erect when fairly established. The only new sort tested in this region that gives indications of being as hardy and valuable as the varieties I have named, is Stone's Hardy, from Wisconsin. I fruited one-year-old plants of it this season and was much pleased with it, but must give it another trial before coming to a conclusion concerning its merits. I have tested Early Harvest for three seasons and have found it too tender for this latitude. G. COWING.

Raspberries for Market.

A person starting out in the culture of raspberries should select a rather high, rolling piece of land. I prefer a stiff clay loam, moderately rich, to any other soil, for the reason mainly, that in time of drought it holds moisture better than a lighter soil. If the piece selected is not well drained, I should before setting a plant, have it thoroughly drained.

After selecting location the next thing is the varieties to plant. Of the red I would recommend Turner and Cuthbert. The Turner is a moderately early berry, very hardy, bright color, and of good flavor. The Cuthbert is a little later than the Turner, of larger size, hardy, and sells at the highest market price. Of the newer varieties, Hansell and Superb are promising and very early.

Of the black caps I would recommend Souhegan and Tyler for very early, and Gregg for late. There is a new variety which I have thoroughly tested that is a wonder in its way, I refer to Shaffer's Colossal. The plants are propagated from the tips and their fruit is red, becoming purple when very ripe. I have found it the best canning raspberry on my place.

When canes are received, if not ready to set out at once, heel them in the ground.

Mark off the rows either with a one-horse plow or by running a line and digging the holes with a spade. The rows should be at least five, nor more than six feet apart, and the plants set from two and one-half to three feet in the row. Be careful and not set the black cap varieties too deep, especially on heavy soils. The crown of the plant two or three inches below the surface is about right.

The red varieties can be set at the same depth as they were when taken up. Press the dirt firmly around each plant, drawing a little loose dirt around afterwards. I have found Spring by far the best time to set plants; if set in the Fall, mulch with some coarse material and mound the dirt over each plant to keep from heaving.

Now keep the soil well cultivated, the oftener the better, until about the first of August the first year; after that do not cultivate after fruit begins to ripen. For working among the rows I use a common spading fork; it does not cut the roots, but pulverizes the ground well. Hold it in a perpendicular position and work it around; do not put under and raise the roots.

When plants get about two feet high pinch the tips off; this makes them grow branching and less liable to be twisted and broken by the wind.

As soon as possible after the fruit is all picked remove the old canes and a portion of the new ones leaving the strongest for bearing next year. For removing the canes I use a piece of steel about the width of a pruning knife blade, curved into a hook and fastened into a handle about two or three feet long. This is the best instrument for the purpose. Very late in the Fall or early in the Spring cut back from one-quarter to one-third of the new growth. For this purpose I use a pair of steel shears the blades of which are about one foot long and about one to one and one-half inches wide, fitted into light wooden handles—with this tool a man can do a large amount of work. Cut the smaller canes further back in proportion to the larger ones.

In marketing select the man or firm, which upon careful inquiry you find most reliable. Then if you pack your fruit honestly, which you should make a point always to do, and raise choice fruit, which you can certainly do if you give it proper care, you will reap a good harvest.

Blackberry Culture.

For blackberries select a high location. Heavy, well-drained soil is much preferable to light soil. Use

the same care in the selection of varieties, setting of plants, thorough cultivation, and pruning as in raspberries. Rows should be from seven to eight feet apart and plants should be set two and one-half to three feet in the row. Do not set any tender varieties. Snyder and Taylor's Prolific I have found the hardest I have tested. The Snyder is quite an early variety and enormously productive. For that reason the canes must be thinned and pruned closely. Taylor's Prolific is later and of very fine quality.

The Blackberry, if kept in proper shape and well cared for, is very profitable—even more so than the raspberry. E. H. SCOTT.

The Strawberry.

HINTS TO BEGINNERS.

Strawberry growers are to be considered in three classes: 1. Those who grow the fruit simply for the pleasure and for home use. 2. Those who grow for a very near market. 3. Those who grow berries for distant shipment. Any advice given to a beginner should be based upon a knowledge of these facts, and of the soil to be used.

Pretty fair crops of strawberries can be grown upon almost every kind of soil which produces common farm crops. But on some soils, the berries though looking well and tasting well, will not keep well, and can not be marketed at a distance.

I will not undertake to say what soils will develop this fault. I have grown berries on a poor, sandy soil which would not endure shipment a hundred miles; while on land looking no better, crops have been grown possessing great endurance and shipping capability. The variety in both cases was the Wilson. I cannot say what element was lacking in the one case that was present in the other. My impression is that good, clay loams will generally produce better berries for eating or marketing than sandy or black prairie lands. And yet it is probably a fact that more strawberries are grown on sandy soils in the United States for market, than on all other kinds of land. It would be well always to experiment carefully before planting largely for distant shipment.

So far, then, as the soil and the management is concerned, the first two classes may be considered as one. But the grower for market must consider the taste and the whims of the market as to varieties. The grower for home use will be more particular to have varieties good to eat, than those simply big or handsome; while the market grower will soon learn that fine appearances count for more than good eating qualities. People who buy fruit of any kind or in any market, so far as I can learn—I speak of the majority of buyers—pay more for beauty than for flavor. Hence, the Monarch of the West, a very high flavored berry, which colors very poorly, will generally be rejected, while the Wilson or Capt. Jack, both very sour, but coloring well, will sell promptly.

It will be best for the beginner to plant those kinds known to succeed well in his neighborhood, if he can learn this fact, and known to be popular in his market, if he grows for sale. Plant two or three varieties only, if for market, but experiment moderately with others. If pistillate varieties are selected they must be set in alternate rows or narrow beds, with perfect flowering kinds. But different sorts must not be allowed to run together; and they should be kept entirely separate in the picking.

The grower for a distant market, or where the fruit is to be kept a day or two in the ordinary temperature of Summer, is limited by those conditions in his choice of kinds. He must have sorts which endure well, and which are comparatively firm. The list of these sorts is a short one. For this purpose the Wilson stands first, and the Capt. Jack next, and I can almost say last. I speak of kinds generally introduced. Other and larger varieties endure shipment pretty well while the weather is quite cool, but very few of them bear long transportation in hot weather.

Now to begin with the beginner at the beginning of a strawberry plantation: First, take good land if you can get it; if not, take poor and enrich it if you can. If you are planting for home use, be sure you plant on some kind of land; if you can't get good, take poor. You can and should grow strawberries for your own table. If for commercial purposes, it is desirable that the conditions should be favorable. Select then the best soil you can command—such as would grow good potatoes or corn. Plow it well in the Fall; plow it well in the Spring; good common plowing will do.

Don't fool away money in trenching or deep subsoiling unless you like to. Plant in the Spring; not in the Fall; not in the Summer. In setting plants don't follow any aristocratic directions. Don't dig a hole, then make a mound in the hole, then spread the roots equally all around that mound and then sift in the earth through a sieve, as some good people say; I say don't do it that way unless you greatly enjoy the fun of the thing. That will do for a dozen plants, but it is too slow for large quantities, and a fast, easy way is just as good.

Your ground being well prepared, plowed, harrowed and rolled—mark off carefully for rows. Your plants, being well trimmed, should be dipped in water and placed in a pail. An active boy should take the pail of plants and place them deftly in openings which you make with a good spade. Thrust the spade in before you at an angle of forty-five degrees; the boy puts in the plant while you withdraw the spade and press the earth firmly over the roots of the plants with your foot. If not clearly described this is easy to do, and a man and boy can set four or five thousand plants in a day in good shape.

Your field planted, cultivate carefully and thoroughly, but very shallow next the plants. Do this all Summer. Let no weeds grow. Let as many runners grow as will make a narrow matted row, cut the balance; keep the middles clear all the time. Mulch in the Fall heavily between the rows, lightly over the plants. Don't disturb them in the Spring.

If you pick for market, pick every day; put no poor ones in the boxes. If you eat these berries, you will be glad you planted them; if you sell them, I hope you will get well paid for it.

PARKER EARLE.

THE A, B, C, OF STRAWBERRY CULTURE.

The illustrious Beecher recently said that the world progresses more by learning what cannot be done than by putting in practice any brilliantly conceived idea. Therefore in giving these bits of experience I do so with the hope of enabling others to avoid the errors that I made myself, for I began with A at an early age, and if years of practice are to count I am now pretty well along in the alphabet.

When asking information before I ever handled a strawberry plant, I was told to select poor, light, sandy soil as the best. I was told that fertilizers impaired the quality of the fruit and the plants would grow, and could be kept clean only on light land. Greater mistakes were never made, although the strawberry is such a good natured plant, it will take hold and make the best of things wherever placed (a most commendable disposition all will admit) yet it never pays to impose upon good nature. It is true that plants can be more readily kept free of weeds on light soil, and this is the only bit of truth in the information I obtained. On the other hand the strawberry is an exceedingly gross feeder—a perfect gourmand so to speak—and not particular as to diet; stable manure, ground bone, wood ashes, hen manure, night soil, hog manure. It will thrive on them all, though it prefers to everything else cow manure, from its cool nature and abundance of nitrogen and one is not likely to give it too much.

The greater the amount of fertilizers given the plants the greater will be the yield and size of the fruit they will give in return.

Besides being a great feeder it is a deep drinker. By this I mean there are few fruit-bearing plants that require a greater supply of water, or suffer more from the lack of it. Therefore, the folly of planting on light, porous soil will readily be seen. For this reason, also, is mulching of great benefit to the strawberry, which I will speak of more fully a little later.

I have said the strawberry is a gourmand, and very much disposed to drink. These are natural habits and not acquired ones, hence, good, and advantage should be taken of them. Were it not for these propensities it would not seem possible for the plants to produce the enormous crops that it is possible to obtain. Therefore in preparing the soil, not only should it be well fertilized and well pulverized, but prepared deeply—a foot at least and as much further as you will—for the double purpose of placing in the soil a large supply of plant food and to induce the plants to thrust down long roots deep in the soil to obtain it, and thus to withstand drought with comparatively little injury. There are so many ways and distances practiced in planting that I will attempt to describe none here, merely suggesting that the strawberry plant is one of the easiest

to make live and to plant in a manner that will admit of easy culture. They look very pretty in narrow rows when first set out, but alas! the weeds and grass will appear, and like bad habits, they are of a ranker growth and must be kept down or they will suppress all the good. If the patch is of much extent it should be planted in a manner that will admit of horse cultivation by all means.

Well do I remember my first strawberry bed. The way I planted it I could cultivate only with the hoe and my fingers. How hot the weather! How long the days! How relentlessly did the scorching sun blaze down upon me while pulling the weeds from among these plants.

It requires a good deal of moral courage to keep all of the runners cut off, but such must be done in order to have fine fruit. Although easily clipped off with a hoe there is perhaps nothing in strawberry culture so often neglected, both by experienced and inexperienced growers. The latter lack knowledge, the former too often lack courage to put their knowledge in practice. But the plants should be kept in hills or single rows at best, for an excess of plants has the same influence as weeds in a strawberry bed, diminishing both the size of the berries and the yield.

In speaking of planting, I should have said the plant of the strawberry is one of the easiest to transplant if properly planted. A very common error (and one I made to perfection in setting my first bed) is to plant too deeply. The fact that plants of cabbage, tomatoes, and many garden vegetables live and thrive better if planted deeply, perhaps leads to this mistake; at any rate, if the crowns of strawberry plants are placed below the surface they will decompose and die. In planting, set the plants no deeper in the soil than when growing, or with the leaves even with the surface. The roots should be straightened and placed their full length in the soil, pressing it firmly on every side to prevent drying.

To be successful in strawberry growing as with everything else, the cultivator must be forehanded, and especially is this the case in planting, which should be done as early in the Spring as the frost is out and the soil in a condition to "work," or as early in the Summer as the plants have become well rooted.

Do not expect to excel everybody else at the outset, too many entertain such ideas and meet with such ignominious failures as to be ever after discouraged from making another attempt. In planting my first plants, no ordinary kinds would do for me; oh, no! and I planted wholly of the Nicanor, then a new variety selling at a high price; the result was that the crop was extraordinarily only in its diminutive size in all respects. I then planted Wilson and Agriculturist, and did "astonish the natives" in every truth, both by the size of the berries and the yield.

Begin with the old, reliable sorts; it will be quite time enough to court the acquaintance of the frivolous bellies of the season—the novelties—when you have established friendship with the worthy matrons.

Let no one plant strawberries unless he will protect them in Winter. Who would expect a cow to give a large yield of milk, or a horse to look and travel well if left exposed to the inclemency of the weather? One might as well expect the best returns from his strawberry plants without protection. Not much is needed and most anything will do, for the strawberry is not at all fastidious; salt meadow hay, leaves, straw, chaff, or other loose light material is preferable, but shavings, pine needles, tan bark, or corn stalks, will answer. Evergreen boughs are excellent; but the best of all is stable manure, as the soluble portions leak into the earth and supply food for the plants, while the fibrous portions remain upon the surface and afford a protection.

Not only does this so-called "mulch" protect the plants from the cold and blighting winds of Winter, but keeps the ground cool and moist during Spring and the fruiting season, keeping the fruit from the ground in a clean and sound condition. It should not be applied until the ground has become slightly frozen in Autumn; but under no circumstances allow it all to remain to prove a smothering blanket to the plants when growth starts in Spring. This will be the case unless a portion is removed so soon as the ground becomes thawed and settled in Spring.

After that nothing remains to be done except wait a few weeks until strawberry time, and then—I deem it unnecessary to explain what to do, even to a novice.

I. T. LOVETT.

WESTERN NEW YORK HORTICULTURAL SOCIETY.

Reforming the Nomenclature of Fruits.

BY PRESIDENT BARRY.

An attempt is about to be made to bring about some reformation in the names of fruits, and although the subject will be brought before the society in a proper form, a few words of reference to it here may not be out of place.

The need of some reform has long been felt, but has been regarded as such a difficult, if not impossible undertaking, that no serious or persistent efforts have been made up to this time.

At the last meeting of the American Pomological Society, a series of rules were adopted as a basis of reform, and President Wilder has taken up the matter with his usual earnestness. I am sure that every nurseryman and fruit grower appreciates the necessity of this movement and will give it his support. Its success will, in a great measure, depend upon the co-operation of such societies as this.

I understand that many of the leading societies throughout the country have taken action on the subject already.

Quite recently I had some correspondence with the editor of the French Horticultural Journal, and he has promised to have the matter brought before their societies. A distinguished French author, Decaisne, in his great work, the "Jardin Frutier du Museum," attempted reform and made a vast number of changes to simplify and improve the nomenclature, but scarcely any, perhaps not one, of his changes have been adopted in catalogues or other publications. It is difficult to change a name of long standing and general use. Nothing but a general and well directed movement will do it. Our nomenclature is really a reproach to pomological science, and if this movement succeeds it will be the crowning work of the American Pomological Society.

Pear Culture.

• Mr. Willard—Can grow on his land what might not be best in all localities. The *Rutter* has proved a profitable pear with him, although it is not of first quality. It bears well, keeps well, ripens without rotting at core. Manning's Elizabeth is a great bearer, and proves profitable, although small. Localities differ and we must decide upon those that do best in our own locality. Kieffer stands at the head of the list with him. Not one of the highest quality. Some consider it ahead of Clairgeau in quality. Bartlett, Anjou, Bosc, and Clairgeau are all profitable varieties.

Thomas had some years found Seckel very profitable, but this year it was very poor. Bartlett and Lawrence are always successful. Had a Kieffer three years from bud that bore three pecks of fruit. It is a large, fine fruit, with but one defect. It is not fit to eat. Had seen them in Philadelphia of pretty fair quality.

Mr. P. B. Crandall, Ithaca—Would name Duchess first; it pays him best. Next Anjou; third Seckel. Duchess, in quantity, would double any other variety. His is a heavy soil with eastern slope. Had thirty varieties; Sheldon blighted exceptionally bad. One tree he covered with earth over the roots, three feet deep, and it remained thrifty and productive. Diel was very productive under similar circumstances. Anjou very productive on quince; also Duchess.

Wm. P. Rupert, Geneva—Few pears in number, comparatively eaten out of hand; more canned. Would claim nothing for Kieffer in eating, but in canning it is ahead of everything.

D. E. Rogers inquired about Flemish Beauty. He has 200 trees bearing well. It is a good pear, and will sell for twice as much as Seckel. It is generally condemned on account of blighting and the black fungus.

Mr. Barry—Had specimens of the variety that were very fine.

Mr. Hoag—Duchess failed with him as a standard. Mr. Arnold had some Duchess standards bearing well.

Daniel Conger, Wolcott, has standard Duchess, and did not consider it fit to eat.

Mr. Thomas had seen the mixture recommended by Mr. Hooker, for blight, applied, to pear trees, and they

still blighted. Though successful remedies were generally put on just as blight is disappearing.

Plums.

N. Bogue has about 100 Lombard plum trees, planted in 1878, and have borne four seasons. Applied night-soil pretty freely before planting and had manured heavily since. Had a good crop past year. On two rows the leaves dropped considerably, and those rows received less manure than the others. Plums require heavy manuring. Sold past year's crop for two dollars and fifty cents and three dollars a bushel. Grows no other variety.

Mr. Willard gave as his most profitable varieties: Bradshaw, Hudson River, Peter's Gage, Reine Claude, Gueil, French Damson and Copper.

Woodward had found Richland a profitable variety. Small, but a good shipper and sells well. Almost curculio proof. Give all the manure you can and thin the fruit. Came from Hoopes Brothers & Thomas, of Pennsylvania, and is a seedling of the common Damson.

Mr. Hoag had trees set one year ago last Spring with 500 to 600 plums on last season.

Willard's plums were in bloom when the cold storm came. Those that had bloomed and petals dropped before the storm, set fruit well and those that had bloomed after the storm also set well, but those that bloomed during the storm failed. He had put salt under some of the trees and thought it, by cooling the earth, had the effect of retarding the blooming. Put about six large handfuls under a tree.

Dr. Sturtevant had found considerable evidence that salt delays blooming by cooling the ground. Is experimenting in that direction.

Grapes.

J. S. Woodward, Lockport, said as far as he had observed, planting grapes was never as active as now, in Western New York. People are just learning to use grapes.

C. L. Hoag, Lockport—There are many vineyards now at Brocton, and along the shore of Lake Erie, and they are intending to plant largely there next Spring. They are going to plant extensively of the Niagara; also of the Concord. Some think of digging up their apple orchards and planting their ground to grapes. He had lost but two crops of grapes in twenty-seven years. Had Niagara that produced five tons to the acre.

George E. Snow, Brockport, lives on Keuka lake—Grapes there suffered much from early frosts, but not to the extent to destroy the crop. It succeeded better than other crops. Planting is increasing very rapidly in that section, in favorable localities. Concord, Catawba and Delaware are the leading varieties. Brighton, Niagara, Prentiss and some others, are now being planted. Had not seen a *ripe* Catawba this season.

M. F. Varney, North Collins, Erie county, said but few vineyards are growing in his vicinity, and they are on the hills. Can't ripen Catawba; nothing later than the Concord.

Luther M. Hair, is from the vicinity of Seneca lake—In the vineyards there, the vines best cared for did the best. The largest vineyard marketed sixty-seven tons and put 100 tons in wine. Previous to past year the numbers were reversed. Some are planting Tallman (or Champion) for market. Ripens early and sells well in market.

S. D. Willard, Geneva—Worden is much better than Concord, and ripens much earlier.

Daniel Conger, Wolcott—Worden was the only grape that ripened in Oswego county. He had for market in addition, Concord and Delaware.

John J. Thomas, Union Springs, had Worden, Poughkeepsie Red, Concord and several others, and in walking among his grapes, he almost always puts his hands upon the Worden. He had Champion, but they hung on the vine unpicked.

George G. Atwood, Geneva—Worden on the same trellis, will ripen a week earlier than Concord.

Josiah Salter, city—Moore's Early will ripen two weeks earlier than Concord and at the same time as Champion, and it is much better than the latter. It is a moderate cropper, not equal to Concord.

Samuel Rogers, Lockport—Fruit growers on the Hudson have concluded that Champion is earlier than Moore's Early, but neither is fit for cultivation. Champion is not good, and Moore's is inclined to drop. Concord is still the main dependence there. Catawba fails to ripen. A grape that will bring more money in

market than Concord is desired. Good Concords netted the producer from three to six cents a pound, while some only netted one cent.

Mr. Harrison had eaten Pocklington that were excellent. Mr. Wheeler had seen Pocklington that shelled badly from the stem. Mr. Snow said vineyards near him had Pocklington, and they did shell some. Mr. Willard—Pocklington sold for twenty-five cents a pound, and he saw no shelling. Mr. Van Dusen—Pocklington shelled while Niagara, Prentiss and Brighton were holding well.

Mr. Salter said this was the first time he ever heard of the Pocklington dropping. It is a great bearer, and if allowed to over-crop may drop, as all others would under like conditions.

Mr. Thomas—Duchess is of good quality, hardy, but a little defective in foliage. It grows finely with Mr. Woodward, but his family would not eat it when they can get any other. Mr. Rogers regards the quality of the Duchess as among the best—better than the Delaware and Catawba. Wood growth enormous, but don't bear. It does the poorest with Caywood of anywhere he has seen it. Mr. Thomas thinks it is variable, as is, also, the Poughkeepsie Red, which was very poor last year. Mr. Rogers—Duchess are very apt to have a specky appearance, as if flies had been on it. Foliage liable to mildew on the ground.

W. C. Barry—Amber Queen very high flavored, one of the best, but cluster poor. Its merit is its fine quality; worthy of trial by amateurs. Duchess of fine quality.

President Barry never saw any of Miner's Seedlings that he thought much of. Mr. Lewis—Too foxy and inclined to drop as soon as ripe.

Mr. Prentiss, Pultney—Prentiss did well with him the past season.

Mr. Willard—Vergennes bears well and is of good quality. A week or ten days later than Concord. Don't set well, cluster defective. Mr. Woodward—A good grower, good bearer, ragged cluster, and, with him, drops. Mr. Hoag finds Vergennes one of the best, and early as Concord; much better than Moore's Early. Gross frauds are perpetrated on the country by plates of new grapes exhibited. Dr. Beadle, St. Catharines, Ont., has fruited Vergennes, and failed to find it as early as expected.

Strawberries.

S. D. Redman—Spring, doubtless, is the best time, with a dibber, in rows three to four feet apart, from twelve to fourteen inches in a row. Wilson variety.

Daniel Congor—Sets with dibber, to line, and exercises care to put the roots down firmly in the ground. Raised most of the Manchester; thinks much of it; about half way between Wilson and Sharpless in flavor. Sharpless must be picked when ripe, or is insipid. Has had some great yields of Manchester, and has had some remain on the vines a week after they had turned red without rotting. Set Vick last Spring, and it made great growth of plant. Cuts off part of top in planting, and sets very tight, in rows three and one-half feet by fifteen inches. Lets rows fill in to one and one-half to two feet wide.

N. Bogue explained a method he had seen adopted for family culture. Take a barrel and bore rows of inch holes, about five inches apart. Fill with soil to first row of holes, put a plant in every one; fill up to the next row and set another row of plants, and so on until the barrel is filled. Can get about 100 plants in a barrel. Whenever soil in barrel gets dry, water with liquid manure. In the case described, those planted in barrel had five good berries to a plant, while those planted in ground, as usual, had scarcely a good berry.

H. D. Van Dusen, Newark, N. Y.—Bidwell gave best satisfaction; Manchester, with him, was not of good flavor. Bidwell sold for two cents a quart more in home market than any other. Greatest defect, white tips. Would not recommend it for long shipping.

Mr. Varney—Wilson leads all others in his locality for market.

Mr. Van Dusen—For yield, Crescent leads all. A little need for shipping, but good for canning. A pistillate needing fertilizing. Will greatly outbear Wilson.

I. C. Arnold, Benton Centre, would name President Wilder and Mt. Vernon for home use.

Luther M. Hair had been told that it is a waste of time to set runners from old plants. He set 20,000 such and lost 14,000. Members were of the opinion that the plants had been frozen while out of the ground.

Mr. Van Dusen—If you have strong, new plants, it makes no difference whether from young or old plants. Charles Downing is good for home use and can pick from same bed for several years. A gentleman said Early Canada is several days earlier than Wilson and of better quality.

J. S. Woodward—Cumberland Triumph is one of the best for home use. Mr. Harris thought we need more than one variety for home use; want a succession through the longest possible season.

Mr. Redman would name for home use: Crescent, Wilson, Cumberland, Sharpless and Mt. Vernon.

S. D. Willard named Bidwell, Sharpless, Cumberland, Crescent and New Dominion.

Mr. Congor named Crescent, Wilson, Downing, Sharpless and Manchester, for home use.

W. C. Barry said the Manchester, from which so much was expected, has been found deficient in an important qualification, to wit, healthy foliage. We did not notice any weakness in this respect until it had ripened its first crop of fruit, which was satisfactory; then its leaves turned brown, wilted, and in a short time after, the original plants seemed nearly dead. Notwithstanding this, the runners continued to grow, and the beds, by fall, were pretty well filled with plants. Hence this may not prove to be a serious defect after all.

The James Vick excels in the opposite particular—fine, healthy foliage. There is not another sort which has such deep green colored foliage. We think, however, in order to maintain the size of the berries, that it will require good cultivation. It has a tendency to over-production, and needs checking or stimulating, in order to obtain fruit of proper size.

Raspberries.

Daniel Congor named Souhegan, Ohio, Gregg, for family or market.

Mr. Van Dusen named Doolittle, Ohio, Shaffer's (for family—color would injure for market), Cuthbert, red.

Mr. Varney—Doolittle, Gregg and Cuthbert.

Mr. Congor—Souhegan is four or five days earlier than Doolittle. Cuthbert is best red.

Robert Johnston, Shortsville—Fruited Hansel on spring set plants and the fruit was fully equal to plate. Tyler and Gregg are his favorites for market. Picked his first Tylers several days before Gregg and it continued to bear as late, making a much longer season. Has proved, with him, the most productive of all the blackcaps. Seems to perfect every germ it forms. Thinks much of the Ohio for drying; very firm. Would give Cuthbert preference among reds.

Van Dusen named following good points of Ohio: Can pick the greatest number of years; has picked from same plantation eight years, and after the plantation was abandoned it yielded a good crop; greater yield than Gregg; hardier, never missing a crop. Gregg will not stand the winter on low, wet ground. A man picked \$1,000 worth of Ohio from two acres. Has been afraid of overstocking the market for the last ten years, but has kept extending. There has been no depression in prices of evaporated blackcaps below twenty-eight cents a pound. In an experience of twenty years has yet to pick his first unprofitable crop of blackcaps.

Samuel Rogers has seen Marlboro growing on Caywood's grounds since 1880, and considered it the most prolific grown and largest, finest berry of any he ever saw. Mr. Caywood's neighbors have confidence in it. Has seen it after it had fallen off on the ground in good, firm condition. Earlier than Cuthbert, continuing about three weeks.

W. C. Barry said the Cuthbert has done admirably. It is an acquisition and does the originator credit. Shaffer's Colossal is valuable in its way, being very hardy and productive, but the berries are of such a dull color that they will not be attractive in market. Hopkins, one of the newer Caps, better flavored than Mammoth Cluster, but the plant is not so productive. Kentucky and Belmont, two varieties of recent introduction, produced invariably malformed berries, hence, seem to be valueless. By far the handsomest berry I saw last season among many kinds was Knevet's Giant. The fruit is as large and handsome. In this case a truthful representation would equal the exaggerated colored plates we are often called upon to admire. Being a European variety, it may not be sufficiently hardy to answer all purposes, but for the amateur it will be worthy of culture. Souhegan and

Tyler are so nearly alike that it would require an expert to detect any difference, and then it is probable that they would be pronounced similar. To my taste the Tyler is preferable. They are both valuable for an early crop and supply a want which has existed. The Marlboro has large, handsome foliage, quite distinct in this respect from any other variety. Superb is another distinct variety, producing large, round berries; somewhat dry and of fair quality. It is said to crumble badly. Herstine has again proved itself to be one of the most useful varieties.

BLACKBERRY.—Snyder sustains its previous representation for productiveness and hardness. Taylor is larger, later and quite promising. So is Duncan Falls. Western Triumph produced only imperfect berries.

Manures.

BY PROFESSOR G. C. CALDWELL.

As my first, bottom fact of all, I would give this: supposing that a man sets out with the right kind of location, soil, markets, etc.; he can keep his fruit farm in a good condition, and make all the money that the case will admit of, provided that he can get all the stable manure that he wants, of a fair quality, and at a fair price; you will certainly admit this as a fundamental fact; if not, I might as well stop right here; for I must build the rest of my foundation on top of it. Supposing this to stand, let us inquire next, what are the materials contained in the stable manure that give it such a universal value? They are, no doubt, its nitrogen, in various forms of combination, its phosphoric acid, in the form of phosphates, its potash and its lime, neither of them in the forms familiar to us in the potash from ashes, and quicklime, but as entirely neutral or inactive compounds; and its organic matter, as the chemists call that part of it which may be burned off by fire, and is burning up in every hot pile of fresh manure, that is becoming fire-fanged. There are other matters in the manure—sulphuric acids in the sulphates, silicic acid in the silicates, chlorine in the chlorides, and magnesia and iron in chemical combination; and they undoubtedly take more or less part in the useful effect of the manure as a whole; but there is not any accumulation of evidence, either in the results of experience or of experiment to show that these substances take more than a very unimportant part in the work; and as we are after only well-established facts, that hold good under all general conditions, we leave these substances out of the count. Nitrogen, phosphoric acid, potash, lime, and organic matter to make vegetable mould—these five materials, if furnished to the crops in suitable forms and in suitable quantities and in a suitable manner would, for many years at least, in the case of any soil that is in a fair condition to start with, produce all the effects of a dressing in like amount of stable manure; and to prolong the effect for a life-time, it would only be necessary to apply at intervals of a few years, or every year a little, salt for its chlorine, plaster for its sulphuric acid, and the German salt, kainite, for its magnesia, to make sure that these other necessary constituents of the food of plants do not entirely run out. Of the five materials above mentioned, the lime also will, under ordinary conditions, need no looking after; partly because it is generally sufficiently abundant in the average soil to answer all the demands of the crops for many years, but more because it enters so largely into the composition of the phosphate that we should have to use more or less freely in any system of manuring without stable manure; and we need give ourselves little trouble about it, also, because if needed in extra quantity it is so easily obtained and applied, as quicklime, or as ground limestone, or in plaster.

So we have, finally, only four substances that we need specially to look after—nitrogen, phosphoric acid, potash, and organic matter or vegetable or animal remains; if we can only manage the supply of these four, rightly, all the rest may be left to take care of themselves, at least for a long while. It seems as if it should be easy to manage so small a business as that; we have brands of phosphates without number, all claiming to be of superior excellence, and supplied to us almost at our very doors; most of them contain some of the nitrogen that we also need to make up our combination; and if they do not contain enough of this, there are nitrates or ammonia salts, sold for their nitrogen only, and of which we can have all we will buy; of potash in suitable forms for plant food there is

unlimited store in the German potash salts, where unleached wood ashes cannot be had at reasonable rates; and of organic matters—vegetable and animal remains—which make up four-fifths of that which is left after you drive all the water out of stable manure, or four-fifths of the dry substance of the manure; where can we buy that? Echo answers, where? We may put a little on the soil in a dressing of superphosphate containing dried blood, added to the superphosphate for its nitrogen, or if we manure with bone meal; but the quantity so added is very small indeed, compared with what is put on in an ordinary dressing of stable manure. Here we seem to meet our first difficulty, in the matter of getting supplies to take the place of stable manure; and perhaps it is going to be no easy matter to overcome the obstacle. It may be well to ask and answer the question whether we cannot overcome the difficulty by paying no attention to it. Is this organic matter plant food? To the best of our knowledge it is not, except in so far as it contains nitrogen, which it always does; but the nitrogen can easily be provided for otherwise; therefore, as far as direct plant food is concerned we can get along without the organic matter of the stable manure. But what farmer or fruit-grower is there that would agree with me and be willing to follow my teaching if I should say to him that his manure will do just about as much good if he should burn it up, and then to replace the nitrogen that would all be driven off in the burning, add to the hundred weight of ashes that he would get from every ton of it, twenty-five pounds of sulphate of ammonia, containing about five pounds of nitrogen, as much as there is that is really assimilable in a ton of fresh manure; perhaps he could not tell why he would much rather have the whole manure; perhaps the agricultural chemist cannot satisfactorily tell why; but if I should call for a show of hands in this audience of those who would exchange a ton of good stable manure for a hundred and twenty-five pounds of such a mixture, of the ashes of the very best manure and sulphate of ammonia in the proportions just given, I am quite confident that it would be a very poor show.

I think I shall not be mistaken in saying that a recent correspondent of the *Country Gentleman* speaks the mind of almost every fruit-grower in this audience, when he says as to the manure question in his own locality, Vineland, New Jersey, after asserting that the farmers will have to resort to keeping cows, to get manure for their fruits that "*commercial manures do not fill the bill.*" Why do they not answer? I see but two reasons; it is either because we do not hit upon the right combination or mixture of such plant foods as they contain; or it is because of the lack of the organic matters—the humus or vegetable mould forming substance which they do not contain, but which the stable manure does contain. If the first reason were the reason, there would not be the slightest difficulty in getting around it; any one of the half-a-dozen manufacturers of fertilizers in the cities could make to order a mixture containing nitrogen, phosphates, potash salts, and all the rest, in so nearly the same proportions as in stable manure, and in so much the same degree of solubility, that no crop could tell the difference when this mixture should be offered to it. Some manufacturers have gone even ahead of this, and prepared dishes, supposed to be even better than stable manure, because containing these foods in just the proportions required by each crop—a principle of manuring that I think has been just as successful in general practice as it is sensible as to its theory—which is very little of either success or sense.

Are we not, then, cornered by the conclusion that if we cannot get stable manure, and wish to do what we can to substitute for it commercial fertilizers, we must in some way make good the deficiency in respect to the organic matter; we must keep up the condition of the soil in respect to its vegetable mould, in other words. This can be done in but two ways, so far as I see; by a liberal draft on beds of rich muck, wherever the fruit-grower has such beds on his farm. If he has no muck beds, then he must resort to green manuring; in this case he will have to manure his farm as all other farmers do—he must rotate his crops; in the case of some fruits this would be no disadvantage, such as those that must be renewed every few years; in the case of others, as the apple, pear, cherry, or grape, it would be quite otherwise; there a course might be followed similar to one which is stated to have been successfully practiced now for ten years in a vineyard in Germany,

of partially replacing the stable manure by a mixture of a special vineyard manure containing soluble phosphates, potash salts and nitrogen compounds.

If you should use muck, and should have access to a variety of deposits, it is well to remember that there are very considerable differences in mucks; as to the plant foot to be used with the muck or with the green manure; if your substitute for stable manure is to be as nearly like the thing for which it is substituted as practicable, you should supply to the crop all three of the specially valuable ingredients of commercial fertilizers—nitrogen, phosphate and potash salts. In a paper which I read before this society in 1879, I showed that, as far as we can conclude from the very limited chemical data at our command, a fruit crop removes from an acre of soil somewhat the same quantities of these three plant foods as are carried off in ordinary farm cropping. Future experience and experiment may show that for this crop or that one a more or less one-sided manuring may do better—that for one kind of fruit more than the average proportion of potash will give the best results—that for another phosphate is especially successful; but I do not think that as yet we have had enough experience with commercial fertilizers on fruits, so that we can lay down any rules at all in regard to their use in the orchard or the small fruit garden.

Every fruit-grower is accustomed to the use of stable manure, and knows just about what it will do for him; and he naturally shrinks from launching out into any new course so long as he can follow the old one with any show of success. But unless the complaint of your president is without reason, somebody has got to move in the matter; and it ought not to be a great while before reports on the use of commercial fertilizers will begin to come in at these annual meetings, and we may begin to accumulate some experience, to be of service for future guidance.

I do not see what more I can do for you, in response to your appeal for more manure, than to lay down these few principles that may help in the search for and the use of materials to supplement the insufficient supply:

First, that there is enough to be had, and at fair and reasonable prices, of everything that is contained in stable manure.

Second, that, at least for the present, we need not attempt to supply all these constituents of the stable manure; that we can obtain the same results we have been getting, if we can only learn how to maintain in a proper manner the stock of vegetable mould in the soil, by a suitable supply of fresh vegetable matter in a green manuring, or of partially decayed vegetable matter in muck, and in addition can learn how to use successfully the three useful ingredients of these commercial fertilizers, to which we must resort if we are going to try to get along without stable manure.

Underdraining.

BY JOSEPH HARRIS.

In this section we can easily get rid of large quantities of water in the spring from the surface of the land by the use of plow and hoe. On our winter wheat fields we attend to this matter at the time of sowing in the autumn. On land to be sown with spring crops this practice is not so common, and yet a few hours' work with a three-horse plow, followed by hand hoes, will let off more water in a day than the sun will evaporate in a month. It will enable us to commence plowing a week or ten days earlier than if this work is neglected.

There is much land, however, where surface drains do little good. We may not see the water on the surface, but underneath the land is wet and will stay wet till it is baked hard and dry in summer. Such land, before it can be profitably worked, must be underdrained.

Land resting on a dry, porous subsoil is already underdrained. Such land, for a few years after it is first brought into cultivation, is likely to be very productive, but in a few years will need manure to maintain its fertility.

Land which is not naturally drained often contains large stores of plant food, lying in an unavailable condition. Underdraining, by removing the stagnant water, lets in oxygen, and, as we sometimes say, "sweetens the soil," and renders it exceedingly productive. I do not propose to weary you by any

remarks on the general subject of underdraining. You all know its importance, and how to perform the work. I want to ask this intelligent body of practical and scientific men a question. What is the chief object of underdraining? The general answer is to get rid of all the water which the soil will not hold by capillary attraction. Lawes & Gilbert found that an acre of their wheat field contained, on the unmanured plot, 1,396 tons of water; on the plot dressed with artificial manure, 1,549 tons; and on the plot dressed with fourteen tons of barn-yard manure every year, 1,670 tons of water. There are underdrains running up each plot eight and one-fourth yards apart. When the soil contains more than the above quantity of water the underdrains run; when the quantity gets down to this amount the underdrains stop running. The larger the crops, the more water will they take up from the soil. By actual experiment, Lawes & Gilbert found that a crop of manured hay that yielded a little over one and one-half tons per acre evaporated two inches more water—say 200 tons—than the unmanured crop of less than one-third of a ton, and another heavily manured crop that yielded over three tons of hay per acre evaporated three and one-fourth inches—say 320 tons—more than the small unmanured crop, and a crop of barley evaporated nine inches—say 1,800 tons per acre—more water than the land lying in bare fallow alongside.

A healthy, vigorous, well-fed plant can use a large amount of water, even in the moist, cool climate of Great Britain. How much greater quantity can it use in our hot, dry climate?

Is the object of underdraining to get rid of water? Fresh water is not, necessarily, injurious to plants. Stagnant water, by depriving the plants of oxygen, is injurious. If we can make the surface of the soil, early in the spring, dry enough for the operations of tillage and sowing, and, at the same time, remove all stagnant water from the land to the depth of say three feet, the object of underdraining will be accomplished. Is this true? If so, then we can introduce a new system of draining. If we fill a barrel with dry soil three feet deep and pour on it say fifty quarts of water and let it remain till it is thoroughly diffused through the soil, and then bore a hole near the bottom of the barrel, as we do in leaching ashes to make soap, no water will run out. The soil holds it by capillary attraction. If you stop up this hole and pour on twenty quarts more water this extra quantity of water will remain in the lower portion of the soil and, if left long enough, will become stagnant and injurious to plants. On the other hand, if the hole at the bottom remained open this extra twenty quarts of water would have drained away and we should have an ordinary well-underdrained soil. After the barrel of soil was saturated with the fifty quarts of water and the hole left open at the bottom, if it was then placed in a larger barrel of water eighteen inches deep, we should, in process of time, have eighteen inches of stagnant water in the barrel of soil. But if the barrel of water was standing in a running stream eighteen inches deep, and we then poured on twenty more quarts of water, this twenty quarts of fresh water would displace twenty quarts of water from the bottom of the barrel and we should get rid of the stagnant water. We should have a water logged soil, eighteen inches deep at bottom, but it would not be stagnant water. Whenever it rained, or we poured water on top, the fresh water would not be discharged below. It would drive out the old water already in the soil.

I have on my farm two cases where a series of underdrains discharge through an outlet that is from a foot to eighteen inches below the water in the open ditch. The drainage is apparently just as efficient as if the outlet was free. The land can be plowed as early in the spring as any on the farm, and the crops are quite as good, or better.

I am satisfied such a system of tile draining can frequently be adopted with advantage. I would dig the drains when the water in the stream or ditch below was low enough to allow the tiles to be put down three feet deep. Of course when the water rises eighteen inches in the stream or ditch we should have eighteen inches of water above the bottom of the tile, but it would not be stagnant water; and the upper eighteen inches of surface soil would be porous and moist, but not wet.

There are some precautions needed. A short, single underdrain, in such circumstances, would soon fill up with sediment, but if a series of drains were all conducted into one main drain, laid with large tiles, no

stoppage need be feared. There will be sufficient force to the water to keep the drains and the outlet free.

NEW JERSEY HORTICULTURAL SOCIETY.

Manure—Fertilizers, and Modes of Application.

BY THEO. F. BAKER.

The Flemish people call manure the God of Farming, and to the observing tiller of the soil of to-day it is being exemplified more each succeeding year. Especially so in the older States, by the continual cropping and returning nothing to the soil to pay for what has been taken off. "Robbery is equally a crime whether it be perpetrated on the soil or on thy brother," is a Roman maxim and one which criminalizes the general-ity of farmers who annually rob mother earth. Chemistry illustrates the air as invariable in its composition, always furnishing carbon, nitrogen, oxygen and hydrogen in excess of all plant needs; while the soil is exceedingly variable. A fertile soil must therefore correspond with the air, and furnish food to the roots as does the air to the plant, tree, or vine, containing and furnishing all the ash ingredients, phosphates, sulphates, carbonates of potash, soda, lime, magnesia, alkali, chlorides, etc., essential to promote a vigorous growth. Therefore, to obtain such fruits, flowers and plants in our worn and barren soils we must supply in some way the required elements that have been consumed by this repeated process of cropping and robbing the soil. Artificial or cultivated growth is rapid and therefore exhaustive; to still reduce it we remove the crop for consumption, thus rebutting nature's natural laws to recuperate itself, as seen in the forest and prairie. This, then, is the theory for manuring—supplementing for what we receive; some plants draw more of one particular ash than others, therefore requiring more of that particular element than plants of another family. In what shape, and at least cost, can we best secure these needed elements? Manure being the general refuse of vegetables and plants, with the droppings of animals, contain all the elements of vegetable nutrition, which, therefore, makes a complete manure—most farmers and cultivators say. Yet, my experience has been to the contrary—in every instance tried—as applied for garden crops. Besides manure, I am compelled to use large quantities of fertilizers of some kind, and, to test the merits of each, began a series of experiments in a small way, using best stable manure on one rod, fertilizers of different brands on another, and the two (manure and fertilizer combined) on a third; each plot to represent equal amounts, dollar for dollar, and noted the result carefully for four years, and, from these observations, have settled down to a combination of manure and fertilizers first, artificial fertilizers second, and manure alone last, to produce early, large and paying crops in the garden. The first item in manuring is the cost, and what will give the largest returns for a given amount of dollars invested, manure or fertilizers? In applying manure I use from 40 to 50 two-horse loads per acre on an average, though I have used 100 loads. The 40 or 50 loads would cost, in our city, from \$70 to \$90 per acre, besides the hauling and spreading. Allowing the whole expense of manure, hauling, and spreading to amount to \$100, that amount would purchase two tons bone, or two tons Stockbridge, and nearly two tons Mapes' fertilizers, or $\frac{1}{2}$ tons Peruvian guano; now, if any gardener will apply either of these fertilizers alongside the manure, dollar for dollar, I wager the crop that the fertilizers will give the earliest, largest and therefore, best paying crops on my soil—sandy loam, clay sub-soil.

As a combination, I use 25 loads of manure and one ton of fine bone, or one ton of reliable fertilizer, saving about \$20 per acre by the combination, and have always received for such manuring good crops and handsome profits. When applying fertilizers alone I use from one to one and one-half tons per acre; for a garden crop in the Spring. One ton per acre is less than an ounce to the square foot. By manuring in this way and increasing the amount, and deepening my soil accordingly with subsoil plow, I have increased the

receipts of my farm from \$1,750 to \$7,300 for one year from sales alone, besides what was consumed at home by family and stock. By high manuring and thorough tillage one can produce crops from one to two weeks ahead of others, and being of good quality, owing to quick growth, the market fresh, they find ready sale, at prices that return good profit.

By the time the market is overstocked your crop will be harvested and the same ground ready for a second crop, the one manuring being sufficient to produce both crops. I have used night soil, but not in the crude state, always mixing with marsh mud or muck at the rate of one to three, working over twice and use for hill or drill, for which it answers well, but find no permanent benefits from its use broadcast.

Another combination which I have made, and used for two years with good results, is 25 bushels of hen manure, dry and sifted fine, to 400 lbs. of cotton seed meal, 400 lbs. plaster, 400 lbs. fine bone meal, 400 lbs. sulphate of potash and 10 bushels marsh mud or muck, which, when completed, will make about one and one-half tons at a cost of \$17 per ton. This combination has given as good returns, side by side, as bone meal, night soil and different brands of fertilizers, and is a saving of fully \$20 per ton.

MODE OF APPLICATION.

All stable or yard manure are hauled out in the Fall and Winter and spread broadcast on a fall-plowed surface, that the rains and snows may wash and leach out the fertilizing elements, and deposit them in the soil ready for immediate action on the crops in the Spring; being distributed and in a soluble condition the plants receive the benefit at once, and show vigorous growth of both root and plant, while on land Irish manured the plant develops at the expense of the tap-root, and when the time comes for the head or bulb to form it must stop and wait for renewed strength to come from new rootlets and the food from the soil—just the time for the enemies of the crop to commit their depredations and destroy the crop.

Another benefit is derived from fall manuring, inasmuch as the soil is protected, and in the spring is mellow and spongy, and will withstand drouth better, is easier put in condition for a crop, and the after culture lessened. I also apply 500 lbs. sulphate of potash broadcast in the fall, per acre, that it may be dissolved and mingled through the soil by spring, insuring the safety of my seeds from its effects.

All fertilizers are sown broadcast after the plow, and thoroughly mixed with the soil by an Acme harrow, and followed by the common scratch harrow. Broadcast all you can, and as little in the hill as possible, would be my advice; else your prospects will be flattering, your crop a deception. Belonging to my farm is eight acres of river bottom land, or banked meadow, where the soil or deposit averages ten feet in depth of sediment and vegetable matter, entirely free from grit and considered inexhaustable, only requiring lime once in five years to produce 75 bushels of corn per acre, or heavy crops of grass. I tried growing late cabbage on one acre of this land and gave it one ton of Stockbridge manure, broadcast, to the acre, and harvested a heavy crop—big heads, and 95 per cent. heading. Another acre was put to cabbage and the same fertilizer applied at the same rate, in the row. I had immense leaves, covering the ground, and but few marketable heads, not over 30 per cent. A few rows were omitted without fertilized, and from these rows not two per cent. was marketable, and very little to show that plants had been set there. They were feeble growers, and the lice overpowered them—while none were to be found on the acre broadcasted. This experience proves, to me at least, that it pays to fertilize even our best and seemingly richest soils. Crops of the garden grow fast, and mature in a few weeks at most, when the conditions of the soil will admit and enough food in the proper condition, soluble, is at hand to furnish their immediate demands. To do this we must fertilize and manure heavy each and every year, and broadcast, has been my experience.

BRIDGETON, N. J., 1884.

E. Roberts thought the price of the stable manure was ridiculously low. In the vicinity of Philadelphia it would cost twice as much; and yet taking this standpoint the disparity between the two would be much greater than Mr. Baker had put it.

J. Burt thought his manure cost him \$2.00 to \$2.50 per load, and others had paid \$3.00 to \$3.50 per ton.

J. M. White fully confirmed the views of Mr. Baker as to the value of commercial fertilizers, but thought

we could not dispense with stable manure altogether; believed in supplementing it with commercial fertilizers. Had used night soil on sod ground, for cabbage, at far less cost than any other manure he could get; it cost him \$1.25 per load. Inquiry was made as to the value of leached ashes.

D. Baird had used them but never saw any benefit. J. S. Collins concurred.

B. B. Hance had seen benefits from their use on poor land; on good land it was not so apparent.

Z. U. Matthews had used them on sweet potatoes with decided benefits, but on strawberries he could not see any profit.

Wm. Parry had not found much benefit from its use alone, but composted, found it excellent. Ashes, bone, marl and salt composted in equal quantities would generate heat you could not hold your hand in; by turning it two or three times the bone would be completely decomposed, and was applied to any crop with benefit; the marl and salt supplied all moisture necessary.

Dr. Hexamer stated, this one paper of Mr. Baker's alone was very valuable and had fully paid him for coming here. In farming as in any applied natural science no definite rules could be laid down that all could rely on. It is a thing everyone has to decide for himself. On his soil ashes was one of the best fertilizers. Does such heavy fertilizing pay? Mr. Baker has fully answered this question in the affirmative, in his case, when he states his receipts have increased from \$1,700 to \$7,000 a year; but it is hardly safe to give the fertilizers the full credit of this; they have rendered it possible to grow the crops that his energy and management have disposed of with such profit.

Mr. Roberts asked Mr. Baker if marl in his compost would not be better than muck?

Mr. Baker: Yes; and now I would increase the potash and reduce the plaster, because the former was soluble and the latter was not.

J. B. Rogers said, Prof. Clark, of Amherst, Mass., used fertilizers of quick action for strawberries; one-half in Fall and one-half in Spring; for peaches, one-half in Spring and one-half in midsummer.

E. P. Beebe had tried muriate of potash on three acres, 500 lbs. to the acre for corn, and had about 75 bushels per acre; was very well satisfied; he also finds it destructive of insect life. He dissolved it and washed fruit trees beneficially, but it did not do for strawberries.

Z. U. Matthews used nitrate of soda, costing \$60 per ton, and found it profitable.

Mr. Meech used kainit because he thought he got potash cheaper in that form than any other.

One speaker deplored the loss of manure from leaching, and going down beyond the reach of plants; another thought the loss upward was as great.

Dr. Hexamer said the ammonia or grasses of manure only evaporated; the soluble portions went down and the use of marl prevented any loss in that direction; yet marl was of no use on some soils, his own for instance. There was much to learn in the application of manures. They vary much in their composition. We must use more fertilizers and frequently. By using all the resources at our command he believed farming could be made the most profitable business going.

W. F. Bassett had found his light soil much benefited by long and continuous manuring.

Mr. Minch asserted that the chief value of marl was in the phosphoric acid it contained. The potash in the green sand marl is insoluble. The Shiloh marl contains none.

A. H. Augur, said that ashes and bone composted with stable manure and plaster was considered a valuable manure in Connecticut, and those who used it continuously always had good crops.

Transportation of Fruit.

BY C. W. IDELL.

The transportation of fruits is an important item of interest to the growers, particularly when the fruits are compelled to pass over several connecting lines in order to reach a market, for it is subjected to delays of a greater or less extent at each connecting point, and these delays are in turn repudiated by each line, so the receiver cannot decide which is to blame, or does it make much difference, for one can get no recompense for losses from either.

I believe the cause of these delays lies entirely in the want of interest in the matter by those whose business it is to attend to the trains on their arrival; for, as you are aware, fruit is generally transported in the night when the tracks are clear of passenger trains, and the superintendents are absent from their offices, so the management of the fruit trains are left entirely with those running them; and it is these persons who care nothing about the delays, for they lose nothing by them, or do their employers pay for their negligence, and I believe that if the facts regarding these delays could be ascertained, that in eighteen out of twenty cases it would be found that they were owing to the indifference of these officials.

The only remedy for this evil that I can think of, is for the shippers to keep an agent at these connecting points to take the time of the arrival and departure of each train, and when delays do occur, for them to report at once to the president of the road, for it will do no good to report to any other.

When you make an arrangement with a company for a reduction of freight on your fruit always insist upon the early arrival of the trains, and the immediate delivery of the fruit on arrival, instead of having the cars run in a section of the yard where the car men cannot get it, as is often done; for late arrivals create a heavy loss in the value of the fruit.

There is another great evil to be met and overcome in these companies. I refer to the uniform and persistent stealings by these officials, or with their knowledge and consent, of goods placed in their care. It seems to be the prevailing idea of the employees of these lines that they have a perfect right to open fruit packages and take from them such quantities as they may select, and strange as may seem to some, that when complaints have been made to those officers whose duty it was to prevent it, that either they were unable to cope with their employees, or else did not care if they did steal. This I know to be a fact, for during the past fruit season some thief or thieves would habitually open fruit packages consigned to me and steal a portion of their contents in spite of all the complaints I made to the superintendent of the freight department, and I am convinced that he did not care, for I believe that had he cared he could have put a stop to it, and if he tried and could not stop it, most certainly he was unfit for the position he held.

In order to show you what effrontery and impudence some of these officials possess, I will state a personal experience with one of them. One morning I stood in the yard of a railroad company, waiting for the arrival of a peach train. While it was passing I noticed that the door of a car consigned to me was wide open. I asked the conductor, who by the way was standing on the top of it, why he permitted persons to break open cars and steal the fruit while under his care? He very coolly replied, "I don't care a damn if they steal every peach on the train, it's none of my business; I am only paid to run the cars in the yard."

It is the indifference of these officials to the welfare of their patrons that has brought about the system of prepaying freight on fruit, for they know that the owners of the fruit often have a just claim on them for losses; and were these lines to prosecute for the freight, a just offset could be made against them. So, determining that they will take no risk, they demand either a pre-payment of the freight, or for the merchant to deposit a sum of money, ranging from \$300 to \$3,000, in their hands, without interest, until the fruit season is over, as a security for the collection of their demands on the receivers, at their place of business in New York.

Fruit pays a high rate of freight, why? Because it requires speed, care and prompt delivery. Now, as the shippers for these items, is it more than just that they should have them, and when a company fails to give them what they have paid for, should they not be made to pay for the losses sustained by the shippers through their neglect?

If these companies were compelled to pay for these losses as they occurred, we would seldom hear of a delayed train, or of a car being broken open and the contents stolen.

There is another evil that I wish to call your attention to, and that is the profession some of these companies make, to return the empty fruit packages free of charge to the owners.

Can any person, possessing common sense, who will stop and think, make themselves believe this to be



true? Permit me to ask such, why should they transport thousands of these packages for their owners free of cost?

Oh, replies one, they can afford to do it, for they charge enough freight on the fruit when that is shipped. Yes, that is just the point; the shippers are charged enough freight on the fruit when they ship it, yet these companies repudiate that fact when you wish the packages returned; but do you ever think how many thousands of these that have this return freight paid on them, are never returned? and that their owners are out of pocket all this sum?

As you are aware these companies refuse to give the merchants a receipt for the delivery of them to their care, or become liable for their safe delivery to their starting point, on the plea that they charge no freight on them, consequently they are reckless in regard to their delivery to their owners; and the result of this carelessness is, that the returning of them by the merchant is always a fruitful source of dispute between the consignor and consignee.

How much better it would be for all concerned if these lines would charge a just price for freight on the fruit when shipped—and no more; then when the empties are returned charge freight on them and give and take receipts the same as they do for all other articles, then the merchant would have a voucher for his shipments, and the receiver would be compelled to give the road his; so there would be an ending of the everlasting disputes and lawsuits for the non-delivery of old berry crates and peach baskets, and the farmer would pay freight only on those that he received.

Pruning the Vine.

BY W. W. MEECH.

Grape vines that have come to a bearing age may generally be pruned so scientifically as to make the prospective results very certain. By examining vines while they are growing any one can very readily see from which buds of the previous year's growth have sprung the branches that are producing the fruit of the current year. This will serve as a guide to the pruning for the next crop, and so on from year to year. Shoots from canes older than the last year very seldom produce anything but wood, but that wood is all right for a crop the next year. Shoots from the axillary buds where the old and new wood are joined will hardly ever produce fruit. The first bud beyond an axil will be found fruitful, but the clusters that grow from the next bud, and for several further on, will generally bear the shouldered bunches of the crop. I have found that six buds on a strong cane, so selected, will generally yield three fine clusters each, and occasionally four. We may look for this number of clusters from the buds of very strong and vigorous canes of the last year's growth up to the capacity of the vines so pruned. Hence, according to the number of perfect clusters we estimate the vine capable of producing we can readily select those giving the best promise, and cut all the others off.

This plan of pruning is scientific, and, while it greatly reduces the labor as compared with the old method of having spurs of one or two buds all over the vine, it as surely gives as good prospect of less wood and more grapes.

RASPBERRY CULTURE.

BY N. OHMER.

BEFORE THE MISSISSIPPI VALLEY HORTICULTURAL SOCIETY.

Raspberries are attracting more attention at this particular time than ever before. Raspberries have always been appreciated more or less on account of filling in the place nicely between strawberries and blackberries. It is a fruit much admired by many, though never so popular as the strawberry. Up to within a few years there were but few varieties. The Red Antwerp, American, or common Black Cap, and Brinkle's Orange, were popular as far back as I can recollect. As much improvement has been made in late years in the raspberry as in any other fruit. We are now not confined to three or four varieties, but varieties of distinguished merit can be counted by the dozens. I have grown the raspberry for market now twenty-six years, but never to the same extent as at present. I now plant largely of them because I find their culture profitable. Any of you can do as well if you have suitable soil, varieties, and understand the proper mode of culture.

To grow raspberries successfully, you must select good soil, well underdrained; let it be clay loam or sandy soil, but prefer upland clay loam. I have known them to do admirably in almost any soil, provided it is rich and not wet. Plow as you would for any other crop, the deeper the better if your soil admits of it. Harrow well; plow out furrows six or seven feet apart, and plant in said rows three feet apart—a partial shade I find to advantage. My patches that do best are in an old orchard.

BLACK RASPBERRIES

are usually planted shallow, an inch or two deep. If it is your intention to tie up your canes that is deep enough, but if you wish them self-supporting you must plant them so that by after culture they will be at least three to four inches deep, otherwise they will not be self-supporting. By so planting and pinching back, as hereafter described, I never have trouble about my canes blowing, or falling down by the weight of fruit.

The first year's growth I pinched back when eight to ten inches long. The second year and every year thereafter, I pinched back the tips of the growing shoots when from twenty inches to two feet high. They then cease to grow in height, but throw out laterals in all directions, balancing and supporting the main stem effectually. The following Spring, early in the season, I cut back all laterals with hand pruning shears, leaving them from one foot to two feet long, according to the number and strength of canes in the hill. This operation is

quickly done and inexpensive. After pruning, I gather and carry out and burn all the debris between the rows. I then cultivate, first with a double shovel or barshear plow, then in time with a cultivator, as often as it is necessary to keep them clean, free from grass and weeds, up to August, after which I let them rest. It is not a good plan to cultivate too late in the season; you thereby cause them to grow too late to mature the wood sufficiently to withstand the cold of the Winter. I plow and cultivate them three or four inches deep. You need have no fear of injuring the roots by so cultivating.

RED RASPBERRIES.

I plant the same distance as black three by six feet. This takes 2,420 plants to the acre. I do not cut back the canes of red varieties (as I do the black) until the following Spring, except strong growing varieties like the Turner, Shaffer's Colossal and others of like character. These I cut back during the season of growth, when about three feet high; otherwise they may grow to seven or eight feet, as I have seen them grow, necessitating the cutting away of too much wood in the Spring. Treat suckers between the rows as you would weeds, unless you want plants; cut them out when young and tender. Sprouts, or suckers, are a great annoyance in growing red raspberries. If taken in time, they need scarce no care. Red raspberries, to do their best, must be kept in hills, same as black. This can be done by cutting away with a sharp hoe all sprouts, when young, between the hills in the rows, allowing from four to eight canes to the hill. Many growers allow them to grow all along the rows, though not too thick.

There is a difference of opinion among raspberry growers as to the best way to cut away the old or bearing canes. I have tried both methods, namely, leaving the old canes all Winter and cutting them in Spring, or cutting them as soon as I find time after fruiting, carrying out and burning them. I am satisfied by adopting the latter method, I destroy many noxious insects, worms in various stages of life, that would live over Winter were I to practice the other system. It is argued that the leaf of the old cane has much to do in the growth of the canes that are to bear fruit the following season. I take no stock in that opinion. If your plants are in good condition there will be leaf enough on the young canes to mature them without the assistance of the leaf of the old canes, that have already performed their functions by maturing the crop of berries just gathered. Then, again, the old canes are certainly not ornamental. Having an eye for the beautiful as well as the useful, I get rid of them as soon as I can after the fruit has been gathered.

For a long time I advocated and practiced the tying up of canes, first to stakes

then to an iron wire stretching along the rows fastened to posts every 25 to 30 feet. Either of the systems I found expensive, and slow work. It did well enough when I had but an acre or two, and did not know any better. But when I had many acres I found that it was not the thing to do, especially so when I learned that stakes and wire were of no use, I might say entirely unnecessary. I cannot help but sympathize with those who are so far behind the times as to follow that system now. By adopting the pinching back process, at the proper time, I save the expense of stakes, or posts and wire, and the time necessary to tie the canes to them, and raise as many bushels of as nice berries per acre.

Setting out Fruit in the Fall.

One of the principal advantages in setting out fruit in the fall is that there is more leisure, and the work can be done better without interfering too much with other work. Spring work is always pressing, and it is often difficult to get the soil in a suitable condition and find time to properly set out the trees. You cannot expect the best results with fruit of any kind unless you are willing to take considerable pains to properly take care of it.

After having selected the soil or plot it should be well plowed in the fall; plow deep and well; if the soil is rich no manure is necessary, but if it is not it will be economy to make it so from the start by giving a good application of well rotted stable manure, and work thoroughly into the soil. I am aware that the old custom was to dig a hole for the tree and put the manure in this, but experience has shown that the feeding roots soon get beyond this and fail to receive as much benefit as they should. Surface manure well worked into the soil furnishes the food in the best condition for the largest number of feeding roots to reach and be benefited by it. Make out some time ahead a list of what you want; get good varieties, and do not let a mistaken notion of economy induce you to select poor varieties simply because they cost a few cents less on the tree. Good trees of good varieties cannot be raised for nothing and it always pays to give a little more and get the best.

Secure a selection that will give you fruit all the year around. This can be done if you are careful in selecting your varieties of fruit. There are so many claimants for the best, and such close competition among dealers, that it would hardly be proper in a newspaper article to give a list of what we might consider the best; then again, what we might consider the best in this section and in one kind of soil, would not pass as among the best in another section on a different soil. Hence in securing a variety it is best to have some knowledge of what

has done the best in your immediate neighborhood, if possible.

Do not set your trees too thick—thirty feet each way is plenty close for apples, and sixteen by twenty for peaches, cherries, crabs, apricots and quinces. It does not pay to crowd too closely. In setting out take some pains to have the trees in as straight a line as possible. The best device to aid in doing this work in the easiest way is to have a board six inches wide, one inch thick and four feet long. Cut a notch in the center, and equal distance from this in each end bore a good sized hole; have two pins that will fit these holes, easily reach into the ground deep enough to hold it steady. Mark off the places where the trees are to stand, put the notch exactly where the tree is to stand, fasten with one pin and turn the plank around out of the way, dig the hole the proper depth and put in the tree, bring back the plank and fasten in the original holes, put the tree in the notch and you will make no mistake or get the tree out of line.

In setting out the trees do not set too deep. There is as much danger of smothering a tree by setting too deep as of injuring the roots by setting too shallow. My plan is always to set in as deep as the tree stood in the nursery. If the roots are in any way dry wet them thoroughly before setting out; take pains to spread out the roots as evenly as possible. In filling up the hole see that the space between the roots is well filled with soil; have the soil rather hollowing about the stem so as to retain moisture. Later on, before severe cold weather comes on, mulch well around the roots. I have also found that it pays, when setting out trees in the fall, to wrap well with old rags or tarred paper to keep off the rabbits and mice; they seem to especially like the bark of the young, newly-set trees, and by doing this work ahead much vexation may be saved. Cut back the tops of the trees well before setting out. To many this looks like considerable work, but if it is it will prove profitable work, far more so than to perform the work carelessly and leave the trees and your work, besides a year's loss in obtaining a supply of fruit; all things considered, it pays to take pains to do the work well at the start.

N. J. SHEPHERD,

In City and Country.

LARGE CROPS OF STRAWBERRIES.—Mr. Hale, who has large experience in raising strawberries, says that right methods of culture will bring from 400 to 500 bushels of strawberries to the acre in a single season, the requisites for success being a thorough preparation of the soil to start with, thorough draining, naturally or artificially, deep plowing and subsoiling, perfect mellowing, and liberal manuring. Productive sorts are of course all-essential.

Raising Small Fruits.

"The frost and the drouth of the present season may lead some of us who are engaged in small fruit culture to look on the dark side, and to feel that we had more to contend with than any other class; and in view of this state of things perhaps it would be well to re-count some of the advantages of our occupation," says Mr. Crawford, in a paper read before Trumbull County Horticultural Society. "By so doing we may possibly find that we have more to encourage than we ever before thought of, even when things were most prosperous. It is natural for us to magnify our difficulties and drawbacks, and forget our advantages. Let us now reverse this order, and for the time being put aside all our discouragements, and consider some of the reasons why we should congratulate ourselves that we are fruit growers.

"It is a business that benefits all classes and injures none. It is almost the only business in which a poor man can engage and be his own employer. Fruit growers are comparatively independent; they are not liable to be thrown out of employment. If sickness hinders for a time, their crops do not cease growing. If friends come to visit, they can take a little time without having to give an account of it, or deduct the price from the few dollars due them at the end of the week or month. It is worth much to a man to be employed at home, to spend his days with his family rather than in some mill or shop or factory. Those who have children may justly consider it a great advantage to be able to employ them during the Summer vacation, when so many children are running wild, and laying the foundation of bad habits which cling to them for life.

"Fruit growers have more leisure than most working people. In the Winter they can take time to plan for the next season, and get everything ready for work. They can attend important horticultural meetings, doing good and getting good; and just here is a point worth noticing. Fruit growers have no secrets; the proceedings of their meetings are published to the world. They have originated many improved methods, but they do not guard their knowledge with a high board fence and locked gates, least others should profit by it. On the contrary they gladly give to their fellow men the benefits of their thoughts and experiences. They adopt the generous motto 'My light is none the less for lighting my neighbor's,' and act upon it. While they meet more frequently than any other class of working people, they come together for a nobler purpose than to connive to monopolize all the advantages their business may possess. There is no monopoly in this, as in many other pursuits. The man with a single acre, or even

a village lot, can engage in small fruit culture, and is quite likely to realize better returns for the amount invested than one with a hundred times as much.

"As fruit growers have a general knowledge of horticulture, they can do more to make home beautiful than any other class in moderate circumstances; and for the same reason they and their families have a more liberal supply of the good things produced by the soil than other people. Fruit growers are intelligent; they do more reading, writing and thinking, and cause more printer's ink to flow than any other class of working people. Fruit growers are independent; they have neither asked or received any special privileges; no protective tariff, no bounties, no remission of taxes, no favors of any kind have been bestowed on them, and no other industry has been taxed to make theirs profitable. Notwithstanding all this the business has had a wonderful growth, and it never was in a more healthy condition than at the present time. Everyone is interested in it, directly or indirectly, and the number actually engaged in it is amazing. It is easy to see that, large as the business is, it will for several reasons go on increasing. The demand is increasing, and the supply so perishable that the market cannot be overstocked for any length of time, however many engage in it. But little capital is required to commence the business. It is not necessary to buy the land, and if it were, a little is sufficient. No expensive implements are needed, and the returns come so speedily that the capital invested does not lie idle long. This is very different from being in debt half a life-time for a farm and the tools and stock absolutely necessary to make it profitable.

"Fruit growing does not require a great outlay of physical strength, as there is but little hard work connected with it; and for this reason it is a suitable occupation for those who are not able to engage in farming, market gardening, or any employment which involves much hard work. Old men, invalids and children may spend their little strength in fruit growing, and be successful. It is preeminently a business for women. There is scarcely any other work in which they can engage with as good a prospect of making money. It requires no great amount of time and study to prepare for it, and after getting established in it one is not liable to receive from some captious employer an invitation to step down and out. Ladies are our most successful florists, and they can do equally well raising small fruits.

"But though small fruit culture offers so many inducement to those who mediate embarking in it, it would be unwise for anyone to engage in it on a large scale without some practical knowledge of the work, no matter how fine and well digested his theories may be.

"Small fruit plants are set out for a special work—that is to send their roots through every inch of the soil in search of plant food, and, having found it, to change it into fruit. Our part is to prepare the soil; set out the plants and see that they have the best possible opportunity to do their work. Last of all we secure the crop. Plant food, to be available, must be dissolved in water, and within reach of the roots. For this reason we pulverize the soil to a good depth and endeavor to keep it moist, so that the roots may readily extend in every direction. That the plant may work to the best possible advantage, the soil should contain an abundance of food for it. To provide this food we enrich the soil. Plants or animals may live with very little nourishment, just enough to prevent their dying, but they are kept at a loss to the owner. Who would think of employing a man and keeping him idle most of the time for want of proper food and materials? When you hire a bricklayer at \$4 per day you employ a cheaper man to carry the brick and mortar. Of course the bricklayer could do it just as well, but you do not want his valuable time spent in that way. So when you employ a strawberry plant to make fruit you should see that the raw material is put within its reach. Spending valuable time and labor in cultivating poor land is one of the most serious mistakes ever made by tillers of the soil. After preparing the soil and setting out the plants we must see that they are kept growing without hindrance of any kind. All our small fruits, except the grape, do best in a comparatively cool moist soil, and in a situation that is somewhat sheltered and not exposed to the full glare of the sun. Plants are hindered in their growth in various ways as by weeds, drouth, and want of air at the roots. Allowing weeds to grow among our plants to rob them of food and moisture, is almost as unwise as cultivating poor soil. One would scarcely expect a manufacturer to erect a building, fill it with tools and material, hire his employes, and then invite all the loafers in the community to come and use his material for their own selfish ends, and yet this would be just about as wise as allowing weeds in growing crops. While we cannot produce rain at will, we can to a great extent, by frequent stirring of the surface and by mulching, prevent the evaporation of moisture from the soil, this same stirring keeps the surface loose and admits air to the roots. After having grown the crops, final success depends very much on the manner in which it is picked and marketed. This is especially true of strawberries, which are often sent to market with such an unattractive appearance that they yield no profit to the grower, and very little pleasure to the consumer. Small fruits should be carefully picked, and all damaged or worthless berries left out. They should be sent to market in clean baskets or

boxes, and each of these should contain berries of a uniform size from top to bottom.

"No part of fruit culture is of more importance than a knowledge of varieties, and this must be learned, in part, by each one for himself. A person with little or no experience should commence in a small way, and confine himself mainly to such varieties as are known to do well in all soils and localities. If everyone would 'prove all things and hold fast that which is good' nurserymen would receive fewer curses and fruit growers more money. As a rule, every one should raise his own plants, except new varieties which he wishes to test. In this way he is sure to have plants fresh, well grown and true to name, besides saving heavy express charges.

"When we consider the healthfulness of the work, that it is carried on in the open air, that it furnishes an agreeable exercise for both mind and body, and that success is in exact proportion to the brain work invested, it is not strange that so many engage in it."

MATHEW CRAWFORD.

Watering Newly Set Trees.

That newly planted trees in certain unfavorable seasons and certain conditions of soil do occasionally require watering will not be denied, but the cases are so rare that they are scarcely to be taken into account. A tree properly planted, with the soil in the right condition, immediately goes to replace roots which had been severed in removal. The earth grows warmer every day, and the young rootlets feel the influence of this heat, and new fibers immediately break from them, as may be seen by examination twenty-four hours after planting. The soil has probably a temperature of 60° or 65°, and perhaps more, but just as all is going well enough, along comes the planter with a pot of cold water, which he dashes around the tree, chilling the earth, and, indeed, often killing the young fibers. Trees can stand a great deal, or twice as many would never survive. The tree leaves out with the great heat of the sun upon the soil, and again the fibers begin to put out; once more comes the shower-bath, often a third time, and if the tree does not die it is in spite of the planter.

It is rare that a tree planted very early ever needs any water; certainly only in a very dry soil, and it should then be given at the time of planting. But later in the season, when the sun's rays are more powerful and evaporation more rapid, possibly one or at most, two waterings are all any tree needs. If the planter has nothing to do, and wishes to show his affection for his trees, he can safely take the syringe, or even a fine rose water pot, and moisten the whole top of the trees, which will do far more good than to drown the roots.—*Canadian Farmer*.

Shall we Plant Pears?

B. F. J.

To this question I answer yes, certainly; but with certain limitations as to soil and situation. To be sure there is danger to be apprehended from *bacteria*, and the resultant pear blight, but much less than most people think; for familiarity with these creatures, infinitesimally little, is breeding a wholesome measure of contempt.

For middle latitudes, there is no fruit tree hardier, longer lived, or more productive than the pear, and as for merit as a fruit it is second only in excellence to the peach, with the advantage of being a longer keeper, improving with age. But to succeed with the pear, certain essentials must be attended to, which restrict and limit its areas of cultivation to gardens and grounds. This grows out of its relatively small root development as compared with the apple, and demands for it a soil which is not only rich in mineral elements of plant food, but a situation where, while the soil is neither cold nor wet, there is moisture enough in it to make the solutions on which the roots feed.

From these peculiarities arise the limitations which confine the successful cultivation of the pear on a large scale to a very few soils, while at the same time they account for its health and fruitfulness within the limited area of city lots, town gardens and grounds. In the latter the ashes from the stoves and hearths, the water and waste from the kitchen, furnish just these materials of mineral food the large demands the pear roots make on the soil, and the consequence is it is hardy and fruitful under such surroundings, and is taking the place of the apple, peach and plum, and threatening the popularity of the grape. To be sure the pear was a partial failure last year, even under the conditions named, but this was the first time for a dozen years, and arose from exceptional causes which are not likely to appear again for a generation.

As for varieties, the choice is limited, there being not more than a half dozen good ones to safely choose from. These are: first, the Tyson, early, small and sweet; second, the Bartlett, the one great pear, beside which all others are a mere cypher; and third, the Duchess, which is very large, very prolific, and very good for show and preserves, but for little else. If anybody wants to try the Kieffer, let him by all means, but don't try more than one or two, for the good and sufficient reason that compared with a Bartlett, it is no better than a common, sour seedling apple measured by Baldwin or a Northern Spy.

To those who in towns or cities have a few spare feet of soil, more or less free air and sunshine space, I heartily recommend the planting of a pear tree or two (on their own roots, mind you; never on quince),

confident that nothing in the fruit tree line will afford more satisfaction.

A Model Fruit House.

A Pennsylvania man with a fancy for fruit farming, has built himself a retarding house for fruit, which cost \$5,000, and which the Philadelphia Press describes as follows:

"To economize space it is built square, fifty feet each way. It has two walls of stone, each twenty-two inches thick, with an open space between of twelve inches, and this space filled in with charcoal, as a non-conductor of heat. Inside of the inside wall the ice is piled four feet thick, maintained in its place by studding and boards. Below the floor is another four feet of ice resting on a foot of charcoal, and above the room the ice is eleven feet thick, with three inches of wood above that; and when he builds another (if he ever does) he will make the ice fifteen feet thick above and six feet at the sides. Still this one works well; it never freezes in Winter, nor does it waste ice rapidly in Summer. The temperature is always from thirty-three to thirty-seven degrees. Of course there are no windows, and it is a real dungeon. There are inside and outside doors made something like safe doors, and as nearly air tight as possible. If one should happen to get shut in, it would not be easy to get an alarm to the outer world. The melting ice from above is conducted down below the under floor in pipes and discharged where it will do the least harm. It takes from 1,000 to 1,200 tons of ice to fill this house, and it is supplied from an artificial pond on the place. The cost of filling is estimated at about fifteen cents per ton.

Profit in Raspberries.

Mr. E. Van Allen of Albany County, N. Y., writes as follows to the *New England Homestead*:

Two thousand Cuthbert raspberry plants were set in the fall of 1881, in rows five feet apart in the rows. The soil was a rich loam. In the spring the plants started early and grew right along, so that by fall the plantation had the appearance of a two years' growth. The young plants were pinched back when they had attained a growth of two feet, and in the rows between the plants a good crop of cabbage was grown. The plantation was well cultivated throughout the season of 1882 and not a weed allowed to grow. Now for the results: The past season there was picked and sold from the plantation of a little less than an acre, 100 bushels of fruit that sold for 13 cents per quart, net; or in round numbers, \$384 worth of berries. In addition to this, 48,000 plants have been dug from the patch this Fall and sold to one

nurseryman for \$3 per thousand, amounting to \$144. Enough plants were kept to set two acres, and the prospects for an immense fruit yield, next season is good.

Underground Irrigation.

Where water is scarce, as in some of the extreme southern counties, or where there is more good land than can be well irrigated from the streams by surface irrigation, a system of underground irrigation has been adopted. It should perhaps be explained, for the benefit of those who have always lived in a wet country, that when water is run over the soil under a very dry atmosphere and a cloudless sky, evaporation is very great; so great, indeed, that when water is scarce it becomes an object to prevent this evaporation, and thus secure all the benefit of all the water for the use of the growing crop.

To meet this want an underground system of irrigation by perforated pipes has been invented and put in use, and is proving of immense benefit. The pipe is now generally made of concrete. The ditches are dug, say, fifteen to twenty feet apart over the field, or in the middle of the space between the rows of trees in an orchard, and by a machine having a feeding hopper, the concrete, ready mixed, is fed into the hopper, and the machine converts it into the required size pipe, and at the same time moves along in the ditch, leaving the pipe behind it. The same machinery perforates the pipe, so that the water is let out of it in quantities required. The pipe being from one and one-half to three feet below the surface, the water is applied that depth down, and all loss by evaporation is thus prevented.

Hints to Evaporators.

Those evaporators who cram their goods into greasy sacks, or press and stamp them into dirty boot boxes or wormy cracker barrels, must not be disappointed if discriminating purchasers fail to appreciate their economy and blissful ignorance. But, as all grain-growers cannot become millers, neither can all fruit-growers become evaporators, but such as do, should endeavor to become the BEST, and make the BEST products, and obtain the best prices, to do which, they must first learn how, and, as the necessary information will not probably come to them by revelation, they had better come to the meeting of our association, and learn from the accumulated experience of others, wherein they have failed, and how they have succeeded, instead of groping or blundering on their way by costly experience and loss of time, to obtain the best results. They can learn at our meetings in a few days' time, and at small expense, what will otherwise cost them much

time, labor and money. And let not those of most experience suppose that they know it all, for there is a wide field before them for improvement. There was much discussion in regard to what variety of apples made the best evaporated product. The Rhode Island Greening, Baldwin, Smith's Cider, Missouri Pippin, Maiden's Blush, Huntsman's Favorite, Roxbury Russet and Jonathan were all recommended for making evaporated fruit of excellent flavor, and fair color. The Ben Davis was said to make the whitest fruit of any, but is not sour enough and lacks flavor, and does not sell well to the largest dealers and best judges.

The following resolution was adopted by a large vote:

"Resolved, That it is the sense of this Association that the extensive planting of Ben Davis to the exclusion of other varieties more valuable for evaporating purposes, is against the present and future interests, both of fruit-growers and fruit evaporators, and we recommend to orchardists early and late varieties of a decided acid flavor."

How to Anchor the Boys.

Editor GREEN'S FRUIT GROWER:—Many suggestions are given to farmers about anchoring the boys on the farm, but none seems to fit the case better than the direction to give him some share in the profits. Something that he may call his own, and which he can improve by industry. Sometimes the "bent" may be very pronounced but ordinarily it is what you make it. It is easy to interest the little boy in small fruit culture, or in the care of young stock; whose growth he watches with keen interest because the proceeds are to be his very own. As you value your good name with your boy, deal as uprightly with him as you would with your neighbors' son. "Don't let it be 'boy's calf, but father's cow.'" When he has gained some money by hard work and the means you have given him to use for himself, don't say to him as another father did: "Dan, you may lend me that money and I will give you my note for it." The money was handed over most reluctantly, and that was the last the boy ever saw of it. That youth concluded to quit farm life at the earliest day he could.

Two boys I knew, had by the hardest earned money, selling apples about the village from a bag carried on an old horse's back, bought a calf. It grew well and was watched and tended with pride, and there were various calculations over the way the money should be invested. But one day a cattle dealer came along, and their pet was sold with the rest of the young cattle; and one of these boys remembered when he was gray-bearded, that they never saw anything of the money.

Very differently did another farmer manage. He gave his boy, any acre on the

farm he would pick out, with leave to use all the fertilizers he pleased, and various other facilities for making his small farm a success. The boy chose to set it in small fruits, for which there was a good market, and every year saw him more of an enthusiast in this culture, and very soon they brought him in most handsome return. City life had no charms for that youth as he grew up.

There is a delight in watching the growth of trees and plants of one's own setting, that is of a most elevating, refining character. It is a foil to many of the temptations of life, which are to be formed in the country as well as in the city. A good paper on the subject, and a personal interest in the culture will cause an intelligent lad to take hold of it with vigor, and will invest country life with a new charm. No wonder Oliver Wendell Holmes said that the best poems he had made were the trees he had planted along the winding river. Would that every "waste place" about our farmer's homes might this year be planted with a vine or a bush or a tree. What a change it would make in the face of the landscape, and in the lives of the dwellers in these homes.

J. E. MCC.

Forms of Trees.

It should be borne in mind that fruit trees are not planted for ornament, and all beauty in the tree must be secondary to an abundance of good fruit. An attempt to shape all the trees of an orchard alike must necessarily fail. The "inverted umbrella" and "open urn shape" recommended for apple trees cannot be had in practice. It is a mistaken notion to suppose that fruit on such trees gets more light than those conical in shape. More surface is exposed to sunlight on a conical tree than on a flat-topped or hollow-topped specimen. Perhaps the majority of varieties cannot be made to assume the obconical or inverted umbrella form, or at least they do not retain it when old. Strive to make the trees in an orchard as nearly symmetrical in shape as possible, but do not undertake to make a tree assume a form contrary to its habit of growth. The person who prunes all trees after one model must make a botch of his orchard. Having decided upon the height at which the top is to be started—and even this may vary in different varieties—the important points are:—1. Secure an opening at the base of the head large enough to admit comfortably a man and basket. 2. Keep the top moderately and evenly thinned of small limbs. 3. Do not run the limbs up long and slender, with no side branches. 4. If in a windy region prune heaviest on the side opposite the prevailing winds. In most cases I have seen ill results follow the cutting out of the center of trees. More light and air are usually needed on the lower branches than

on the interior ones. It is not necessary to read a treatise on pruning before one can prune an orchard properly. The most successful apple growers I have known are those who started the top moderately high, let the tree take its natural form—unless in exceptional cases of an ill-formed tree—and who thinned out the small branches evenly each year. This simplifies the process and renders it more useful.—*American Cultivator.*

Reclaiming a Waste.

EDITOR GREEN'S FRUIT GROWER:—If the fairy who made "transformations" had moved Mrs. Holmes' back door-yard around to the front of the house some moonshiny night, it would have made a stir in the morning. Such a flutter and hurry as all would have been in, to rake up the old barrel hoops and pick up the rusty tins before passers-by began to take observation.

It was a very neglected spot and Cousin Horace's æsthetic taste was a good deal shocked by it, when he came down for a visit. But he was a prudent young man and always thought a good deal more than he said. I presume that was one reason he was accounted so "deep."

He laid a little trap for Cousin Maria and Rufus that worked well, and helped clean up the yard without any fault being found. He "took them by guile," as it were.

"That's a nice rich bit of ground of yours, Maria, just back of the wood-house; I wonder you do not improve it by putting in a grape-vine or two. They would run all over the shed and you might have a snug little arbor there for the children to play in out of the sun."

It was a new idea that such a rubbish corner could be beautiful and made useful, and all adopted the plan with enthusiasm. Horace agreed to make the girls a present of the vines and a beautiful row of currant bushes along the fence, if they would promise to attend them well in remembrance of him, when he was over the sea.

With a good deal of blushing and giggling the promise was given, and all hands set to work to "clear up." That day he drove over to the nursery for the "sets."

"What a perfect sight this yard is!" said Jane; "I had no idea it looked so horrid. All those old dishes and those old battered basins and burdock stalks. What must Horace have thought of it! Let's slick up before he gets back if we possibly can."

Two able-bodied girls and a spry, little boy soon put a different face on the landscape, and by the time Horace was ready to dig it looked like a new place. He went about as unconcerned as if it had always been cleared up, and before he left built a cosy, little arbor, with a pretty rustic seat in it, just where the worst rubbish heap had accumulated.

"There Em., you can sit there and read

my letters when I am gone, and mother can darn her stockings here all summer. You'll say in a year or two that this is better than the parlor." And it was in time the pleasantest room they had. There is no way to reclaim "a waste" better than setting a fine plant there. J. E. McC.

Farm-Yard Manure.

From Dr. Voelker's lengthy reports, the following important and thoroughly reliable information has been compiled:

1. The soluble parts of manure are much the most valuable, therefore it is important to save the urine, and to keep the manure protected from the rain. Manure thrown out and exposed to rain becomes just as worthless as wood ashes thus exposed.

2. Farm-yard manure, in its fresh state, contains soluble phosphates of lime, insoluble nitrogen, and but a small proportion of free ammonia.

3. The urine of horses, cows and hogs does not contain any considerable amount of phosphate of lime; but this is largely contained in the drainage of dung heaps, which are more valuable than urine.

4. The most effectual manner of preventing loss in fertilizing matter, when not composted, is to cast the manure directly on the field, whenever circumstances will permit. On all soils with a moderate proportion of clay, there is no waste if the manure is not ploughed in at once. Indeed, it is maintained by some that it is the best to permit manure to lie on the surface and allow the rain to wash it into the soil. In the case of dry soils it may be evenly spread and allowed to remain for months without appreciable loss; but, on light, sandy soils, it is best to manure with well fermented dung shortly before the crop is put in.

Well rotted dung contains a very much larger proportion of soluble organic and saline mineral matters than fresh manure. It is also richer in nitrogen, and, weight for weight, is more valuable.

6. During fermentation dung gives off organic matter in a gaseous form; but if properly handled there is no great loss of nitrogen. Organic acids are always formed and gypsum is developed. These fix, or hold, the ammonia as fast as it is generated. While fermenting, the phosphate of lime which it contains is much more soluble than when the manure is fresh. Ammonia is given off in the interior of the fermenting heap, but is arrested by the organic acids, and the gypsum in the colder external layers. Turning heaps over, therefore, occasions loss, though some think otherwise.

Wood Ashes for Orchards.

For orchards, says Dr. R. C. Kedzie, in the *New York Tribune*, I regard ashes as worth more than six times the value of

barnyard manure, ton for ton. When barnyard manure is composted with wood ashes, the coarse vegetable material and litter are rapidly broken down, and the manure is speedily fitted for use; there is some loss of nitrogen in the form of ammonia, but there will be no loss of mineral matter if kept from leaching by water.

Wood ashes represent all the mineral elements of vegetable growth, and contain everything the farmer must give his crops except combined nitrogen. Wood ashes will vary in composition and value with the kind of wood and the part of the tree. I will take the ash of the body-wood of the Beech-tree as representing the average of wood ashes. A ton of such ashes contains 320 pounds of potash, worth \$16, and 105 pounds of phosphoric acid (insoluble), worth \$5 25. Omitting all the other ash constituents, which have some value of themselves, the potash and phosphoric acid of a ton of such ashes are worth \$21.25, or nearly six times the value of a ton of fresh horse-dung.

Strawberry Worm.

The time is now approaching when the fly of the strawberry worm may be seen flying about the vines of the strawberry. Along the last of May it makes its appearance, and may be known by its pitch black color, oval abdomen and two rows of dull, white lines. The female will puncture the stem and lay her eggs in the puncture, and in about two weeks the eggs will hatch, and small holes eaten in the leaves will be the means of discovering the worm. The worms are of a dirty yellow and a gray-green color, the head being darker than the body. The worm has twenty-two legs, and when fully grown is about three-quarters of an inch long. When not feeding it is curled up in spiral form on the under side of the leaf, and if disturbed will fall to the ground. They moult four times before reaching maturity. The remedy is Paris green or hebe-bore, dry or dissolved in water, but these poisons must not be used after the fruit has set.—*Western Rural*.

A man near here is growing rare flowering bulbs. In preparing his beds he excavates three to four feet deep, forming a cellar like opening. He then sifts the earth he replaces in this excavation, and mixes it well with muck, leaf mould, sand and manure. This forms a bed so loose he can thrust his arm in it the full length, any time. He says it is wonderful how much rubbish he sifts out of the earth. We have an idea that Mr. Durand grows his seedling strawberries on soil prepared something like this, but not so thoroughly, and as they do not get such soil away from home, his seedlings often disappoint those who have great expectations from them.

Evaporating Fruit,

BY SCHUYLER & HADDUCK.

Management of factories, this year, will need be very economical, and none but real choice fruit should be manufactured, if any money is to be made. Apples, also, will have to be bought very low. The absurdity of paying 45 to 60c., or more, for green apples, as last year, has been demonstrated by factory losses incurred. Ten to twenty cents, as the apple crop now promises, will certainly be all that the prospects will justify. Fruit must be well cored and trimmed, and properly dried and bleached white, and nicely packed in 50 pound boxes, to sell to advantage. Boxes should be well faced with best of average, and paper should be put on both bottom and top of boxes. Wax paper with fly paper on edges, is neatest for top. There is no use sending wet apples to market—those that have been sprinkled or only two-thirds dried—as the maker will lose by the operation. A lot of four car loads from one factory sent to this market this season have sold at 2c. off, merely from being insufficiently dried. They would have ranked as fancy if properly dried. Punch cored apples also sell at 3c. or more less than ring-cut. Anyone having machines that only peel and core solid, can improve their product by having trimmer pass through one side of apple before it is sliced. Apples put up in 5 lb. and 2 lb. pasteboard packages, except for a limited special trade, are not called for, and do not now sell to advantage. This package trade, which was at one time large and popular, has been killed by unscrupulous packing and genuine fraud. Such packages should only contain very choice and fancy fruit; and did so at first, so that 2 and 5 lb. packages were synonymous with highest grade stock. Some smart Alecks here and in New York commenced putting up inferior stock in packages, so as to undersell competitors. They kept putting up poorer and poorer stock, till the only apparent object of the packages seemed to be to cover up the miserable quality of the fruit. The public at last declined to buy the swindling packages longer, and this style of packing is not now wanted. A good trade probably could be revived in packages by a return to strictly fancy stock. In fact the whole evaporated apple trade has been badly damaged and demoralized the past few years by the large amount of trash and miserably manufactured stock offered on the market. Evaporated and sun-dried are losing their widely distinctive characters—some dealers going so far as to say that nice sun-dried is getting to be in fact preferable to average evaporated. Evaporated apples can only maintain their popularity, and a remunerative price, by making them high grade.

The details of factory management should all be very thoroughly and persistently looked after by an efficient superintendent, to have evaporated fruit present an attractive appearance. Everything should be kept clean and every factory should be thoroughly scrubbed all over at least once a week. Jelly stock should be bone dry, and evaporated apples should be thoroughly dry, but not as dry as jelly stock. It requires careful attention to get apples dry and not scorched, nor so extremely dry that they will not come into pliable packing condition in about twenty-four hours. Another point we wish to impress on factory men, be sure your evaporated apple room and bins are thoroughly dusted and wiped with wet cloth before putting in fruit, also your fruit trays or frames. Never tread on evaporated apples with feet. We had several lots of apples the past year that we found almost impossible to sell at all, have some on hand yet and sold those we did dispose of at great discount, and for the only reason that they were dirty and mussy looking from dirty fruit rooms and dirty handling. Evaporated apples should be always white and clean. People who find it necessary to eat dirt can buy common sun-dried, which are usually sufficiently dirty to satisfy any propensities in that direction.

In our large sales of the past year the best grade of fruit in appearance, as far as the manufacturer was concerned, and for which we received the most money, came from our large Missouri factories. They use better apples and take greater pains in preparing and handling fruit. There should be greater uniformity in packing and grading fruit, and if factories would pack with reference to about four grades (they ought not to make the lower grades however), it would be better for trade—say, fancy, choice, prime and common.

Fancy. To be all white rings, well cored and trimmed, made from good apples of the size of choice packing apples.

Choice. To be all rings and pieces, well cored and trimmed, containing no fine pieces, and made of good apples of various sizes suitable for evaporation.

Prime. To be made of any apples capable of evaporation, fairly cored and trimmed, and not over 25 per cent. off in color.

Common. To be apples badly cored and trimmed, and handled generally, and from 25 to 50 per cent. off in color.

If all factories would approximate towards such grading and mark boxes accordingly, it would assist the trade in selling. Always brand box also, so that dealer may know which is top.

NATIVE GRAPES.—Samuel Miller, of Missouri, says the Pocklington is the most showy of the white grapes, and the Jefferson the handsomest and best among the red ones.

Grape Culture.

VINES

The best vines are those grown from cuttings having two eyes, in which a single system of roots radiate from the lower eye like the spokes of a wheel, and the vine grows out of the top bud. One-year old vines are to be preferred in all cases, if first-class, even if two years old, root pruned and transplanted vines should be offered at the same price.

PLANTING.

In planting vines, the single tier of roots should be set as low in the ground as may be and keep the upper node, from which the vine has started, out of the ground, so that new roots will not grow from it. Unless this precaution is taken, a new upper tier of roots, thus encouraged to grow, will, after a time, usurp and displace the others, and the action of frost in clayey soil will gradually, and sometimes in a single winter, throw the vine out of ground and expose these upper roots in an injurious way, and this condition remains permanent. The best time of the year is that which occurs *first*, always premising that the soil should be mellow and friable, and if in autumn, a shovelful of loam should be used so as to completely bury the two or three buds only that are left upon the vine above the surface. The earlier in autumn or spring that the work is done, the better, providing the conditions are as stated.

DISTANCES.

The distances at which vines should be set will depend somewhat upon the strength of the soil and the mode of training adopted. If in all respects as before advised, the best distance is believed to be primarily, in rows eight feet apart with the vines six feet apart in the rows which perfectly run north and south. It will be a matter of great convenience to have the rows consist of but twenty-five vines, thus occupying 144 feet in length; then by omitting one vine, a space of twelve feet will be left for access between two vineyards. If circumstances favor, or rather, if they seem to require, as the vines get age and strength, each alternate vine, including the two end ones in each row, may be removed, thus leaving twelve vines in each that will stand eight by twelve feet apart.

CULTIVATION.

Almost any hoed crop may be grown in the vineyard for one or two years if an equivalent amount of fertilization be given, but after this time grape vines only. Many and various are the implements that have been tried for cultivation and discarded. The plow is here inadmissible. Cultivation should be shallow, perhaps two inches is ample, and this should be done in a way that will not disturb the larger roots, the great body of which lie from three to six

inches deep. The last summer's experience has proved the one-horse "Acme" harrow to be exactly the thing. It is an implement that disturbs the soil from one to five inches deep, at the will of the driver, or in hard ground the rider, and never cuts off the larger roots even if lying at the surface. Cultivation should begin each year as soon as the ground will pulverize in the spring and be renewed after every packing rain, or in the absence of rain, before a crop of weeds has time to show the third leaf.—*Farm Journal*.

A Walk Over the Farm.

A white daisy! I will pull it up and cover it with dirt; the seed being green, it will rot, but if left above ground to cure, it would grow. Well, well! here are three more—I'll pull them. Further along—ah, me! here is a rod square covered with them, and I can't stop to pull them. Bad luck to the fellow when he lets foul weeds get so plentiful that he has to pass them without pulling them up. Whoever don't destroy the first bad weeds that appear on his premises, entails on himself and his posterity troubles without number. Farmers, their wives, sons and daughters, should study botany, so that they can recognize plants by description, and whenever a bad weed appears in any locality, the people and the papers of that locality should put it in the rogue's gallery and send its picture over the country to put people on their guard. Here are oats—ostensibly oats, but Canada thistles are mixed with them in proportions varying from one-fourth to three-fourths. Cut when the thistles are coming into bloom, cured and salted a little, the whole make excellent fodder, especially for sheep. Standing till the oats and thistles are ripe, the mixture is an abomination that men and animals wish to keep clear of. Canada thistles, plowed under in the blow in a dry time, are good manure, apparently sent from heaven for a valuable purpose. Allowed to get ripe we readily imagine they come from the other place.

Large and long experience as a farmer induces me to think that the terrible decline in field crops is more owing to the exhaustion of the humus, the vegetable mould of the soil, than to any other cause. In spite of all pretences and prevarications, a great decline in the productive capacity of the soil of these States has taken place. Improved varieties, improved implements, tillage, and commercial fertilizers, keep up yields, to some extent, but the aggregate of impoverishment is horrible and enormous. We must grow less grain to send abroad, and more to feed on the farm, and we must cart into the yards, and thence into the fields, large quantities of muck that kind providence has stored for use.—*Hugh T. Brooks in Farm and Home*.

Preservation of Fruits.

The first picking of apples is usually the best and ought to be laid aside for winter use. The second gathering—for apples are rarely twice hand-picked—should be sorted out, the least injured ones laid aside and then preserved, and those most injured used at once. When cider is made at home the same rules hold good. Work up those apples that look least likely to keep. The care needed for apples is doubly necessary for pears, as they are more juicy and less liable to resist the rough handling or an uneven temperature. When fruits are first gathered, they, as it is technically expressed, sweat—that is, they exude their superabundant moisture. 1. If this moisture be carefully removed twice, and the fruit neatly wrapped in paper, then stored in an atmosphere that is uniform and moderate, it will keep with ease far into the next year. It is also necessary from week to week to enter the fruit room, which should not be allowed to become too damp on any account, as damp speedily destroys vegetable matter, and look over the rows of fruit. This can be done by taking up a pear or apple here and there at regular intervals and examining its state, and then replacing it if all is found safe, rejecting it if it is found unsound.

In harvesting small fruits, care must be had to collect them in dry weather; otherwise they will require more sugar and more time in preserving, and likewise be less certain to keep well. Still fruit—that is, apples, pears, peaches, nectarines, and such like—bear to be preserved when only slightly pinked. Quinces ought to be canned or made into consistent preserves about one month after having been harvested. The saccharine matter in the fruit is set by that time.

The harvesting of nuts is a small matter, yet annually bushels of nuts are lost by storing them in a damp condition in frozen cellars or over-heated closets. In the nutting season, immediately after the slight frosts, all nuts should be gathered, the husks removed and the nuts allowed to remain exposed to the open air, but under shelter from rains or severe frosts. About the first of December all nuts should be dry enough to store; they may then safely lie three inches deep on the floor of a well-ventilated garret. A cellar is the worst possible place to store fruits in. As every cellar is below the surface, it is more or less damp, if not artificially heated, and artificial heat is expensive, and dampness is strongly antagonistic to safe keeping of any vegetable matter.

The best manner of keeping grapes fresh for winter use is that method pursued in Spain, namely: to pack the entire clusters in thick, open-mouthed stoneware jars, laying dry, putting fresh, hard wood sawdust between them so thickly as to fill up all

interstices; then to place the jars in a cool and even atmosphere, excluding all light. —*Tribune and Farmer.*

[Is this a fact, or do the cool apples cause the air to condense, the same as the ice pitcher? Some people hold that damp cellars are the best for storing apples, even where a foot or more water stands on the cellar bottom.—Editor FRUIT GROWER.]

Prices for Fruits.

The *Chicago Tribune* is of the opinion that the prices of fruit will never be low again in this country. The facilities of transportation are so abundant and the foreign demand for evaporated fruit so constant and increasing that fruit-growing in the United States may be considered established as a paying business "while grass grows and water runs." Thus the production of standard fruit is an increasing business, and not only seedsmen and nurserymen are profiting from it, but those who give most attention to orchards, vineyards, berry gardens, etc., find their interests rapidly on the increase. Our railroads carry fruits and their products hundreds of miles, and render possible the cultivation of flourishing orchards on hitherto isolated hills which were abandoned to the wilderness. Dried fruit is wanted in most foreign countries. Canned fruit is carried from our great seaports to "the end of the earth," and profitably sold. Many of the European peasants use our jams instead of butter on their bread. Dehydrated or evaporated fruit, better than all other kinds, is of general acceptance wherever offered, and valued equally with the fresh products. Within the last ten years the amount of raw fruit brought into England from the United States is something astonishing. In 1871 there were but 56,441 bushels, valued at £40,604; but in 1882 there were 1,065,076 received in Great Britain from this country, worth £387,190, or \$1,881,734.40. The outlook for the American fruit grower is most favorable, and those of the rising generation who have a fancy for the business may enter upon it with confidence that their enlightened efforts will be crowned with success.

PARALLELS IN FRUITS.—There are certain resemblances in varieties of the different kinds of fruit, which are interesting to note. The Baldwin, among apples, the Bartlett in pears, the Crawford in peaches, the Lumbar in plums, and the Concord among grapes, hold a similarity in position. The Seckel pear, the Delaware grape, and the Green Gage plum have a certain similarity, being small in size and excellent in quality. Formerly the Wilson strawberry was as widely popular as the Concord grape but lately the Crescent and some other sorts are crowding it down.

Experimental Pear Orchard.

BY SAMUEL C. MOON IN THE FARM JOURNAL.

I herewith give the record of an experimental pear orchard in which over fifty of the most popular and highly recommended varieties were planted says: "My father started this orchard about thirty years ago and there have been occasional additions made down to the present time. The character of the soil is a fine rich sandy loam. Most of these varieties are still advertised and recommended in nursery catalogues. I give the result of experience with them in Eastern Bucks County, thirty miles north of Philadelphia, for the benefit of the readers.

The varieties which possess superior merit and have been very profitable, can be counted on the fingers. I would name *Beurre Giffard*, *Buffum*, *Bartlett*, *Sheldon* and *Rutter*, as being the most profitable. And as the second five, *Early Catherine*, *Doyenne D'Ete*, *Abbott*, *Seckel*, *Natural* or *Choke*.

I have always found a good market for fruit near home, in Trenton, N. J., and sell whatever grows on the trees; large and small, good, fair and indifferent. Where fruit can be disposed of in this way, without much expense for the freight, commission, etc., almost any kind of fruit trees (if not totally barren) will be profitable; that is, they will more than pay for the land which they occupy, but the pears which are really valuable for the majority of the planters are very few.

The first and most essential requisite for a tree to be valuable, is productiveness; second, size and appearance of fruit; third, time of ripening; very early and very late fruit bringing the highest price; fourth, quality of fruit. Fine looking fruit will command a fair price, even in a glutted market, regardless of its quality, when small or unattractive stock, although of the finest flavor, will go begging for a market, or rot.

Nearly every variety named in this list has been affected, more or less, with "blight" at some period. Those which have suffered least from it are *Beurre Giffard*, *Buffum*, *Sheldon*, *Rutter*, *Chinese Sand* and *natural* fruit.

Those which have suffered most are *Beurre D'Anjou*, *Lawrence* and *Vicar* of *Winkfield*.

The only remedy that I know for blight is to remove the injured branch and burn it; keep the tree growing vigorously and let it repair the loss. If a tree dies plant another; but "don't" grub out an old pear root while there is life in it. It will send up a sucker that will soon commence bearing or form an excellent stock for grafting.

Pear trees seldom need trimming after they get to bearing, except cutting out dead wood, if there is any. *Beurre Giffard* and

Manning's Elizabeth, two of the best pears, and some others, are feeble growers while young, requiring several years to come into bearing; but are vigorous and soon become productive if worked into the top of a thrifty large tree.

I believe the best condition for a pear orchard is to keep the land in sod and never plow it, but not allow the grass to grow within two or three feet of the trunks of the trees; keep the circle mulched with manure, leaves or stones. Manure the land liberally once in three or four years. Allow hogs to root in the orchard and devour all the defective fruit. *Seckel* pears especially are large, fairer, and higher colored when grown in sod than in cultivated land.

Sending Plants by Mail.

So much progress has been made by nurserymen and florists that now it is comparatively an easy matter to send plants any reasonable distance by mail with perfect safety. Of course, such plants require careful packing; not only must they be kept moist, but they must be packed so as to insure them against damage in handling while in the mail. Mail pouches do not always receive the kindest treatment in the world, and unless packages are well packed serious damage will result. Testing as I do a large number of varieties, I receive a large number of packages through the mail, and uniformly have received them in good condition. The first essential in having plants live is to keep the roots damp and uninjured. For this purpose moss is used; over this was generally placed two or three layers of oiled paper, and then over this stout wrapping paper, each wrapper being well tied on, and in this way packages came through long distances without injury. I had occasion to send to Chambersburg, Pa., for a collection of roses; they came as nice and fresh as though they were just out of the ground. They were packed first in damp moss, then a layer of oiled paper; the package in this condition was put in a stout pasteboard tube and then wrapped with wrapping-paper, on which was the address. These must have been three or four days on the road, giving them every advantage of close connection, and yet were in first-class condition, the leaves fresh and green. They were set out and grew right along. Many are deterred from purchasing plants from the fear of their not being able to come long distances through the mail without injury, but my experience is that with the present plan and knowledge of doing the work of packing this risk is reduced to a minimum. At any rate, so far as my experience is concerned, I have always had good success with such plants if proper care were given them after they were received.

N. J. SHEPHERD.

In Germantown Telegraph.

OFFICE OF
—*—
GREEN'S NURSERY CO.,
Rochester. N. Y.



NEMAHA.

Nemaha Black Raspberry.

This variety originated with Hon. Robert Furnas, of Nebraska. Mr. Furnas says it has proved to be hardier than Gregg with him, and a meritorious variety. We have fruited it here two seasons. It has proved hardy, vigorous, of unsurpassed size and productive. Its season is even later than the Gregg.

It is a firm berry, of good quality. Previous to the Nemaha we have had no late variety that is hardy. Early varieties ripen their wood and stop growing early, going into winter in good condition. But Gregg and Mammoth Cluster mature the wood and hold their leaves very late, and winter finds them with soft and tender wood, and they often get injured by severe weather. Es-

pecially is this the case on clayey, latish soil. On sandy soil they are more hardy. If Nemaha proves to be more hardy, it will be a great gain, and Mr. Furnas is very positive that it is. Considering the large number of varieties of black caps, I should hesitate before introducing another without more thorough testing, but feel that Mr. Furnas' statements should have much weight. Visitors who have seen the Nemaha on our grounds have said that it was the largest of all. Indeed I have picked larger specimens from it than from any other, yet I do not think the average size larger than Gregg. It is doubtful if we get a variety much larger. Perhaps we ought to be satisfied with such a giant.

We are Joint Owners

—OF—

MARLBORO' RASPBERRY

Being shareholders of the Marlboro' Raspberry we are propagating it and are prepared to furnish fine plants at the following prices: Retail, \$1 each; \$5 for 6, \$9 for 12, \$12.50 for 25, \$18 for 50, \$25 for 100. Wholesale rates on application.

Description as given by the originator: It is the largest grower, with stronger canes and side arms than any known variety. After being tied to the stakes all winter, having no protection, the branches from the extreme terminal buds at the height of eleven feet, have borne as fine fruit as any other down the cane. It is hardy in the fullest sense. The side branches are two to three feet long, with clusters occurring on short joints more than half way down, and are of unusual strength, bending with a heavy load and not breaking. The great size of its dark-green foliage is the means of its early, regular and late bearing, and extraordinary size of fruit, which is one-quarter larger than the old *Hudson River Antwerp*. The berries average three-quarters of an inch in diameter; and when not retarded



by long and severe drouth, one-third of them will measure an inch. In color a bright crimson, and unlike others, does not lose its brilliancy when over ripe. This has been seen and stated, by the *American Agriculturist*, *Rural New Yorker*, and scores of others. It does not contain the peculiar musky aroma of the *Antwerp*, and is passed upon by all as delicious in flavor. Unlike any other, it will remain four days on the bushes after ripe, and is then marketable. Growers here have picked them from the ground and declared they were fit for market. In quantity of fruit it exceeds any variety we have ever handled. We estimate the returns of an acre of this berry, well cared for, at \$1,000. Old growers here range the profits much higher. The old *Antwerp*, when in its prime, has

done better; and now, at a time when there is no other *Raspberry* before the country which will fill the void made by the loss of the *Antwerp*, and as it is known that a *Raspberry* with requisite qualities will yield a greater profit from a given quantity of land than any other fruit, and as every point we have given above can be verified by hundreds of visitors from this berry section, and also from abroad, *Antwerp* growers here are justified in their ready remarks that it is the "best variety" they ever knew. Send for Catalogue.

GREEN'S NURSERY CO.,

Box 562, Rochester, N. Y.

ELECTROTYPES OF FRUIT

For Sale Cheap.

We have some extra electrotypes of the following fruits left over. If you want any of them, send for prices. Keifer Pear, Peen-To Peach, Tyler Raspberry, Picking Strawberries, Lost Ruby, James Vick Strawberry, Roses, Blackberries, Grape Arbor, Lee's Black Currant, Bidwell Strawberry, Beebe's Golden Raspberry, Shaffer's Colossal Raspberry, Manchester Strawberry, Fay's Prolific Currant, Cuthbert Raspberry, Wheatland Peach, Schumaker Peach, Gregg Raspberry, Ohio Raspberry, Daniel Boon Strawberry, Nemaha Raspberry, Hayes Grape, and many others.

GREEN'S NURSERY CO.,

Box 561, Rochester, N. Y.

PRICES for TREES, PLANTS, &c.

FOR SPRING OF 1885.

Apple Trees—Stark, Talman Sweet, Early Harvest, Red Astrachan, Duchesse, Autumn Strawberry, Munson Sweet, Maiden's Blush, N. Spy, Pewaukee, Golden Russet, Wealthy, Ben. Davis, Grimes' Golden, Wagener, Whitney No. 20, Chenango Strawberry, Wine Sap, Famuse. First-class, 6 feet, 15c. each. First-class, 4 to 5 feet, 10c. each. Lord Nelson, 25c. For other rare varieties see catalogue. We have a rare collection.

Pears—Kieffer, 35c. to 75c. Largest standard varieties 60c.; one year, 2 to 4 feet, 25c.; 12 to 20 inches, 15c. Dwarf Pears 25 to 50 cents each.

Cherries—30c. to 50c.

Plums—25c.

Peaches—\$4 to \$8 per 100.

Orange Quinces—25 cents. Champion, 40 cents.

Meech's Prolific Quinces—\$1.50 each.

Russian Mulberry—12 to 20 inches, 50 cents per 12; 3 to 4 feet, 25 cents each.

Downing Mulberry—Four feet, 50 cents. Larger, 75 cents.

Hardy Rose Bushes—25 cents.

PRICES FOR THE NEWER GRAPES.

Pocklington, Moore's Early, Dutchess, Lady, Prentiss, Lady Washington, Cottage, strong, one year, 30c.; two years 50c. each. Vergennes, Early Victor, 40c. and 60c. each. Hayes' Early, superior quality, white. August Giant, large, very early, good quality. Amber Queen, reddish yellow, early, very good. Centennial, reddish white, good. These last four are offered now for the first time. Price, one year, strong, 60c.; two years, \$1.00 each.

Niagara Grape—Two years, strong. \$2 each.

Delaware, Agawam, Lindley, Salem, Worden, Perkins, Hartford, Concord, extra strong, two year, 15 cents each. For prices of other grape vines and descriptions, see catalogue.

Strawberries—Jas. Vick, Daniel Boone, Manchester, Bidwell, Mt. Vernon, Lenig's White, Sucker State, Primo, Wilson, Finches' Prolific, Sharpless, Cumberland, Crescent, Kentucky, Charles Downing, Windsor Chief, Old Iron, Clad (Phelps' Seedling), Pipers' Seedling, Big Bob, Nigh's Superb, 25c per 12; 75c per 100. Jersey Queen, Woodruff's, Atlantic, 50c per 12; \$1 per 100. Parry, \$2 per 12; \$12 per 100. Cornelia, \$2 per 12; \$15 per 100.

Red Raspberries—Cuthbert, Lost Rubies, Reliance, Early Prolific, 25c per 12; \$1 per 100; \$10 per 1000. Shaffer's Colossal (our most profitable red raspberry)

50c per 12; \$2 per 100; \$18 per 1000. Hansell, \$1 per 12; \$6.00. Superb, Mont Clair, 50c. per 12. Crimson Beauty, 75c. per 12; \$5 per 100. Brinckle's Orange, 75c. per 12.



Marlboro—The most profitable of all, \$1 each; 6 for \$5; 12 for \$9; \$25 per 100. Caroline (yellow) Beebe's Golden, 50c. per 12; \$2.50 per 100.

Black Raspberries—Tyler, Souhegan, Ohio, Gregg, 25 cents per 12; \$1 per 100. Nemaha, \$20 per 12, \$10 per 100; \$80 per 1000.

Blackberries—Stone's Hardy, 75c. per 12; \$4 per 100. Agawam, Taylor's Wachusett, Early Harvest, 75 cents per 12; \$2 per 100. Snyder, Kittatinny, etc., 30 cents per 12; \$1.50 per 100. Early Cluster, 40 cents each; \$4 per 12. Wilson, Jr., 30 cents each; \$3 per 12.

Currants—Fay's Prolific (strong plants), 35 cents each. Victoria, Cherry, White Grape, Lee's New Black Currant, etc., 50 cents per 12; \$3.50 per 100.

Gooseberries—Downing, Smith's, \$1.00 per 12. Houghton, 50 cents per 12. All two years, strong.

For other Fruits and Ornamentals, send for Catalogue, sent free on application, or with chromo colored plate for five cents. The new book, "How to Propagate and Grow Fruits," will be sent free to all ordering plants or trees to the value of \$1 or more. Plants or trees will be sent by express, with orders to collect dues on delivery, providing one-fourth of the amount of bill is paid in advance. Address,

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The person ordering any one of these four combinations is entitled to the new book, "How to Propagate and Grow Fruit."

1 Marlboro Raspberry	
6 Nemaha Black Cap	
10 Crimson Beauty Raspberry	
10 Shaffer's Colossal Raspberry	\$2.00
6 Marlboro Raspberry	
10 Crimson Beauty Raspberry	
10 Shaffer's Colossal Raspberries	
6 Nemaha Black Cap	
1 Duchess Grape, white	
1 Pocklington Grape, white	\$6.00
1 Prentiss Grape, white	
1 Cottage Grape, early black	
1 Agawam Grape, early red	
12 Marlboro Raspberry	
12 Hansell Raspberry	
12 Crimson Beauty	
6 Nemaha Raspberry	
50 Mrs. Garfield Strawberry	\$11.00
1 Pocklington Grape	
1 Duchess Grape	
1 Fay's Prolific Currant	

50 Marlboro Raspberry..... }
100 Hansell Raspberry..... } **\$25.00**
100 Crimson Beauty Raspberry..... }
12 Nemaha Raspberry..... }
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\$6 Per Bushel.

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Meech's Prolific Quince.

There has been some doubt in the minds of a few as to this being a new variety. While visiting Newburg, I took particular pains to get Mr. Downing's view regarding this; and he appeared to have no doubt that it was a new variety. He says in a letter

to the introducers: "It is certainly a promising variety."

The bark of the past season's growth is of a yellowish brown color unlike that of most quinces.

Mr. P. M. Augur, of the Connecticut Board of Agriculture, a well known pomologist says:

The Meech's Quince exhibited at the Waterbury meeting of the Board of Agriculture, struck my attention at once. The photographs showing the growth of the trees and their prolific bearing were indeed remarkable; and from the testimony of commission dealers who have sold the fruit, I am led to believe it must be a remarkable fruit. I do not hesitate to give it trial as soon as it is placed in market. *I believe it will be a great acquisition.*

Last October I had the pleasure of visiting the grounds of the Rev. W. W. Meech, of this place, where he showed me nearly 100 Quince trees loaded with very fine fruit, remarkably fair, and of uniform size, and a deep rich orange color. Mr. Meech is quite confident that he has in this fruit a new variety of quince, which he has named "Meech's Prolific." His method of trimming and cultivating the quince, as well as this particular variety of the fruit, is especially worthy the notice of those about to grow the quince. S. P. TOMLINGTON, Pres. Vineland Fruit-Grower's Union. Price, \$1.50 each.

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- No. 1—3 Plants of Nemaha new Black Raspberry.
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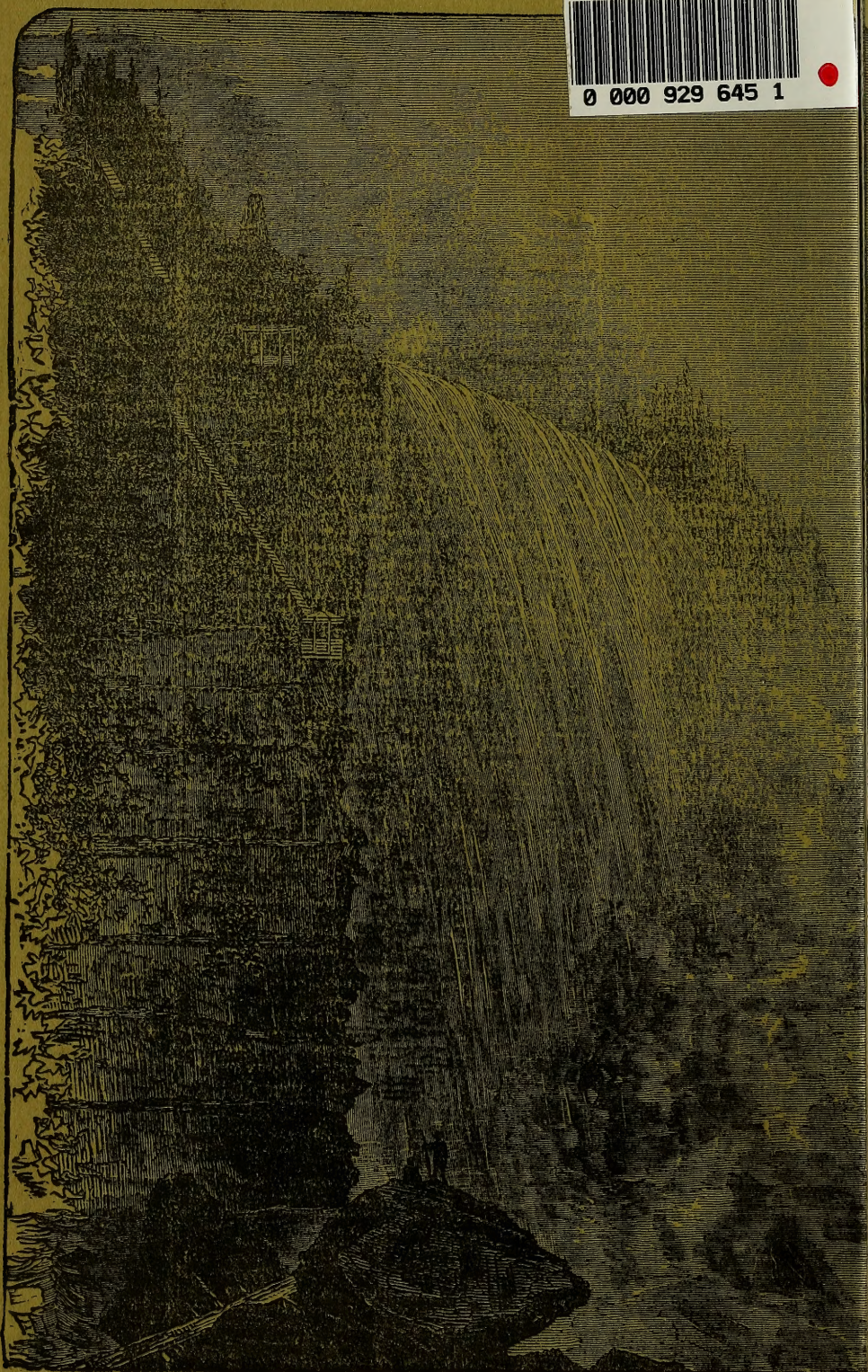
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